

VOLUME CIII

NUMBER FIVE

# THE NATIONAL GEOGRAPHIC MAGAZINE

MAY, 1953

Air Force School for Survival 565  
With 53 Illustrations, 46 in Natural Colors  
GENERAL CURTIS E. LEMAY

American Wild Flower Odyssey 603  
With 40 Illustrations  
28 in Natural Colors P. L. RICKER

The GI and the Kids of Korea 635  
With Map and 31 Illustrations ROBERT H. MOSIER  
21 in Natural Colors GERALD KORNBLAU

India's Sculptured Temple Caves 665  
With 13 Illustrations VOLKMAR WENTZEL

Macau, a Hole in the Bamboo Curtain 679  
With Map and 9 Illustrations GEORGE W. LONG  
In Natural Colors J. BAYLOR ROBERTS

Silkworms in England Spin for the Queen 689  
With 20 Illustrations JOHN E. H. NOLAN

Burr Prizes Awarded to Dr. Edgerton  
and Dr. Van Biesbroeck 705  
With 2 Illustrations

Sixty-four Pages of Illustrations in Color

PUBLISHED BY THE  
NATIONAL GEOGRAPHIC SOCIETY  
WASHINGTON, D. C.

\$6.00 A YEAR

60¢ THE COPY





## School for Survival

565

High in the Sierra Nevada, Airmen Who May Be Forced Down  
Learn How to Stay Alive Until Rescued

By CURTIS E. LEMAY

*Commanding General, Strategic Air Command, United States Air Force*

THESE are the last two entries in an airman's diary, the diary of a B-26 pilot who crash-landed in Labrador in December, 1942.

Three of his crew had set out in a dinghy to get help; they were never heard from again. The other four huddled in the fuselage and, for two months, slowly starved to death as their jumbled assortment of food dwindled away: Spam, Hershey bars, caramels, Coca-Cola, peanuts, canned chicken, dates.

On January 26 the pilot wrote:

"Overcast but fairly calm. Each day, we don't see how we can last another day, but each time we manage to go on. We all smoked a pipe of tobacco this morning, and G. really got sick and I felt pretty bad, but we came out of it pretty well."

### Endurance Is Not Enough

On February 3, he scribbled this final note:

"Spent a solid week in bed. Today W. died after being mentally unbalanced for several days. We are all pretty weak, but should be able to last several more days at least."

Perhaps they did. But it wasn't enough. They were found by Eskimos a month later, all dead. The ironic footnote to their tragedy is this: the Eskimos came from a village only an hour and a half's journey away by foot.

I do not cite this crew's experience in derogation. Far from it. They were gallant men who endured much—and, by the diary's evidence, endured it to the end—with courage and stubborn cheerfulness. But for me and for the command I head the moral is inescapable—endurance is not enough.

The downed airman (and we have had many go down over Red-held Korea) cannot defeat cold and hunger and isolation by sitting on his hands. He must know what to do. He must equip himself mentally and physically to do it. And he must act.

There are still, perhaps, a few "realists" around who will shrug off the loss of such crews as merely a part of the normal attrition which afflicts any operating air force. They could not be more mistaken. To the Strategic Air Command, no pilot, no bombardier, no gunner, no crew is expendable.

The reason lies embedded in hard fact: SAC's mission is to preserve the peace by presenting to the enemy the constant, poised alternative of total retaliation. So far, we have fulfilled this primary obligation. But our deterrent value in peace, and our destructive potential in war, depend alike upon our readiness to deliver a knockout atomic punch—not in a year or a month or a week, but now. Not with crews we might eventually train, but with the precision teams at our disposal today.

Why are these crews so valuable? Because they are made up of human lives and are

### The Author

For nearly five years General LeMay has headed the Nation's striking force of huge strategic bombers. An aggressive and resourceful commander, he developed standard techniques of bombing and formation flying as he led American bombers against both Germans and Japanese. During World War II he rose from major to major general, and in 1951, when only 45, he became a four-star general. A graduate of Ohio State University, he holds a degree in engineering. Since 1951 he has been a Life Trustee of the National Geographic Society—Editor.





### A Survival Trainee in Wilderness Alaska Tunnels an Entrance into His New Home

Crews of the Strategic Air Command, if forced down in desolate terrain, must understand Nature to exist. Survival schools teach the men how to live off the land pending rescue (map, page 569). Students at the 10th Rescue Squadron School, Kotzebue Sound, are taught to build life-saving snow shelters. Two men constructed this snug dome. One remains inside, having placed top blocks in position. His partner now liberates him.

irreplaceable. Because each crew, manning its massive bomber, commands more lethal power than a whole fleet of World War II planes loaded with ordinary high explosives. Because years of intensive training are required to raise each crew to performance pitch.

The ships themselves are important, yes. But the crews are even more so. During the last war it was possible, and necessary, to send airmen into combat after only eight months of training. Many a crew flew its first mission with barely a score of hours aloft together.

Today SAC would rate such a crew as apprentices. They would have to put in another three months of work and a good 150 hours of flying time to graduate to combat-ready status. To make the first team and to become a lead crew might take them from six months to a year and a half.

Nor can even the lead crews rest on their honors. Kept in constant practice, they are never allowed to forget that their individual and group proficiency records come under ceaseless scrutiny. At regular intervals they are checked out on all minute aspects of their

job, from gunnery and navigation to ditching and bail-out techniques. They know, too, that a black mark in any one airman's specialty downgrades the whole crew.

Accountants have put price tags on these thousands of hours of group flying and group training; they say, for instance, that each B-36 lead crew represents a \$3,000,000 investment. They may be right. But the dollar figures tell only half the story. We can replace the money; it is extremely dubious whether we shall, in a crisis, ever be given enough time to replace the crew.

### A School for Survival Is Born

It was with such thoughts in mind that I found myself, during the summer of 1948, sitting at a table at the Rod and Gun Club in Wiesbaden, Germany, talking with two fellow officers: Col. Demetrius G. Stampados and Maj. Burton T. Miller. I like hunting, and so do they. But I had just taken over as Commanding General of SAC, and we had other matters to discuss.

"Look," I said, "as you gentlemen are well aware, SAC's mission is global. Our men





### General LeMay and His Crew Man Life Rafts in the Pool at Offutt Air Force Base

Once a year SAC crews practice ditching procedure. General LeMay (center, hair streaming down forehead) led his men into this pool from a diving board. All the men wear waterproof survival suits and Mae West life preservers. Each SAC bomber carries three life rafts. Two are packed into special fuselage compartments; they can be ejected automatically. Once released, they inflate themselves with carbon dioxide.

are going to be flying over some of the worst terrain in the world, and some of the most remote. Every now and again some of them are going to be dumped on it. Maybe they'll ditch, maybe they'll jump, maybe they'll crash. But their problem is going to be the same: how to survive off the land, whatever that land may be—tundra, jungle, desert, or just mountains.

"I want them trained to survive. And I want to set up schools in which they can get that training."

We battled the subject back and forth. Miller had been an outdoorsman and an ordnance expert all his life. Stampados, a peacetime big-game hunter, had become in the war a member of the British Commandos and of the Eighth Army's Long Range Desert Group, had served as an intelligence officer for the Office of Strategic Services, and had operated behind enemy lines in the Balkans and the Far East. He had learned survival techniques the hard way.

The upshot of our Wiesbaden conversations was the activation, on December 16, 1949, of SAC's 3904th Training Squadron at Camp

Carson, Colorado. The school commandant: Colonel Stampados. Its research and development officer: Major Miller.

To aid Stampados in his ground-breaking work, we combed the Air Force and the ranks of Army reservists for skiers, explorers, mountaineers, trappers, woodsmen.

We were lucky. We netted men like Lt. Col. Charles A. K. Innes-Taylor, transportation officer for Admiral Byrd's 1934 Antarctic expedition and a former Canadian Mountie\*; Capt. Willie Knutsen, Norwegian habitué of the Arctic (page 575)†; Per Stoen of the Arctic Indoctrination School at Nome, Alaska; survival expert Maj. L. E. Dawson; Hans Siewers, who had trapped in Greenland; M/Sgt. K. E. ("Slim") Moore, Canadian-trained dog-team handler; M/Sgt. William Ferreira, who escaped three times from German prison camps; and a swarm of volunteers

\* See "Exploring the Ice Age in Antarctica," by Richard E. Byrd, NATIONAL GEOGRAPHIC MAGAZINE, October, 1935.

† See "Milestones in My Arctic Journeys," by Willie Knutsen, NATIONAL GEOGRAPHIC MAGAZINE, October, 1949.





### Airmen in a Distress Drill Evacuate a Globemaster by Hurling Down a Canvas Slide

Recently the Air Force and civil agencies devised a special method for emergency evacuation of the work-horse Globemaster transport. Tests proved 214 men could quit the big plane in 100 seconds. This crew practices at Brookley Air Force Base, Mobile, Alabama. The first men out descend knotted ropes (on hatch), then hold the tarpaulin for others to slide down. Numbers identify some of the test participants.

who had seen service with the ski troops and with the 10th Mountain Division in Italy.

With such a cadre of instructors, the 3904th set up shop in the Colorado Rockies as an advanced survival school. To it were channeled successive classes of SAC airmen who had taken standard survival training at the Air Force base units, using such terrain as the jungle at Ramey, Puerto Rico; the Okefinokee Swamp at Turner, Georgia; and the woodland at Lockbourne, Ohio.

They came to Carson, summer and winter, to get really intensive instruction in dealing with the kind of terrain they are most likely to encounter in a major war—the terrain of the

north (map, opposite). At Carson, National Geographic photographer Volkmar Wentzel took many of the fine photographs which illustrate this account.

Success in Colorado made it clear we would need an even bigger training area to handle both our own SAC crews and those of other commands who now sought our instruction—airmen from the Far East Air Forces, from the Tactical Air Force, from Military Air Transport Service, and from the Royal Canadian Air Force. Accordingly, in 1952 we shifted the bulk of our advance work to Stead Air Force Base, 10 miles northwest of Reno, a few miles from the high Sierra Nevada, which



runs along the California-Nevada border.

Stead, a rather bleak, treeless encampment on the sagebrush flats beneath the mountains, houses the students for only five days. The rest of the 15-day course they spend in a wilderness training area, testing, under conditions of real stress, their capacity—or incapacity—to survive.

The moment these crews land at Stead they begin to realize they have left luxury behind. Debarking from trucks, they draw sleeping bags and march off across dusty roads to the square hot tents they are to occupy—and keep clean—while on the base. Next morning they stumble from their cots at 0530 to start their first day of indoctrination and appraisal.

From then on, through three grueling days, the crews eat, drink, and dream survival. Lecturers pound the facts of outdoor life into them in concentrated bursts. Civilian analysts run them through group performance tests. Jumpers refresh their knowledge of parachute technique (page 575). Radiomen check up on their skill with emergency transmitters, and instructors give them tips on terrestrial navigation.

#### An Airman's Best Friend—His Chute

One order which is rammed into them at every opportunity is this: hang on to your chute: it's an airman's best friend. They begin to understand why when they consider the catalogue of things that can be made from its canopy, shrouds, webbing, and metal fastenings. To name a few:

Blankets, bedrolls, tepees, lean-tos, snares, slingshots, fishhooks and fish lines, nets, seines, mukluks, eye shields, hats, scarves, puttees, insect hoods, splints, bandages, slings, packs, sails, snowshoes, spearheads, and signal panels (pages 573, 596, and 598).

When the crews aren't tied up in lectures and tests, they often drop into Stead's display building and study its static exhibits—deadfalls and Apache foot snares, gun traps and gill nets, rafts, lean-tos, paratepees, fish spears, racks for smoking meat, and (in some ways the most interesting of all of them) the E-1 Survival Kit (pages 574 and 580).



569

Drawn by Irvin E. Altman

#### SAC's Survival Training Emphasizes the Strategic North

In a major war bomber crews would fly polar routes, hazarding snow and cold if downed. SAC's advanced school at Stead Air Force Base, Nevada, specializes in northern survival. Air Force bases are designated by open circles; towns and cities by solid circles.

This 42-pound outfit, which a flyer can attach to his chute harness, contains 42 items that give him the best possible chance of surviving in any climate, any terrain. They range from a 3½-pound folding-stock rifle to a vacuum-packed sleeping bag; from five days' concentrated rations to a mosquito net; from fishing tackle to extra socks. Each item has been slimmed down to its minimum size and weight; each has been field tested.

Before students leave for the hills with this kit, they must get squared away on a primary problem of survival: how to reach land safely in the first place. Instructors at Stead remind them of some gruesome statistics: one airman out of every three who bail out leaves his plane uninjured but is hurt or killed on landing.

Some of these casualties come from smashing into trees, some from drowning under the chute, some from poor posture on impact. But others in these days of stratospheric flying stem from ignorance or forgetfulness of the hazards of jumping from high altitudes.

A man bailing out from a B-36 at 35,000 feet runs the risk of pulling his ripcord prematurely and suffering a crippling jolt. Or he may fail to use his auxiliary oxygen tank, or use it improperly, and black out.





### Hungry Flyers Deep in the Everglades Stretch and Scrape a Tasty Rattlesnake

Airmen are told that the tropics, with their teeming life, offer an excellent chance for survival. These trainees, having removed the diamondback's skin (on line), prepare the meat for supper.

That doesn't mean that men shouldn't jump from a crippled ship, high up. It does mean that they must be trained, and trained again, in the essential techniques; and that, if it's at all possible, they should stick by the plane until it has lost sufficient altitude.

If a crash landing is feasible, it should be preferred to indiscriminate bail outs. It's not only safer but it gives the survivors the benefit of whatever equipment the plane is carrying, plus the use of the fuselage itself as temporary shelter and as a rescue marker.

#### Training Scotchs False Notions

Crews that come to Stead are taught, too, that though their training here will emphasize survival procedures adapted to northern woodlands, they will do well to pick up pointers on living in the jungle, the desert, and on Arctic tundra and ice.

From training films, from the new SAC *Land Survival Guidebook*, and from talks by Stead's civilian survival experts, they garner a good deal more information than

they can perhaps retain. Some of it, however, stays with them, and more will come back to them as they need it.

The basic and most useful impression that they derive, I think, is that neither jungle nor desert nor Arctic is as nightmarish as portrayed in pulp fiction. When an instructor asks a new student what would be the first thing he'd do if he came down in such country, he'll often answer, "I'd shoot myself!"

But he soon learns that in the jungle, for example, he need go neither hungry nor thirsty. He'll be able to find water in young cane stalks, juice in vines and the fruit of most trees, blood in any turtle or animal. He can eat any beast with fur on it, any palm bud, any flower without a milky or colored sap.

He's taught, too, that even if he loses the mosquito net from his E-1 pack, he can make a pretty good head protector from his T shirt. As for other insects, he's told that he can eat them—grasshoppers and certain butter-



flies (minus their wings and legs), ants and ant eggs, wood grubs from rotten logs. Not appetizing, perhaps, but nutritious. And certainly abundant. If the Australian aborigine can dine happily off snakes, lily roots, worms, and lizards, the trainee is told, why, so can he. And if an Arab considers fried locusts a treat, then a hungry American flyer shouldn't pass them up.

#### How to Paralyze a Fish

One tip that generally tickles the airman's imagination is the notion of using the sap from a sandbox tree to catch fish. He learns that if he mixes this stuff with sand or dirt and spreads it on a pond or stream, it will paralyze the fish so that he can scoop them up by hand. Moreover, they'll be just as edible as if hooked on a line.

Most students, of course, don't exactly look forward to a meal of roast sloth, broiled termites, and fern-shoot stew, topped off with wild figs and trumpet fruit. But they do find it distinctly reassuring to realize that the jungle holds substitutes for the corner grocery store and the post exchange.

Even the Far North, they are surprised to discover, can offer a large and remarkably varied larder to a man not too finicky and not too lazy: bats, lizards, newts, frogs, snakes, wood grubs, rock tripe, and the woolly lousewort (page 592). The over-rich liver of the polar bear, they soon gather, is better left alone; but lemmings can be tackled with some profit.

Stead's instructors naturally encounter some resistance among airmen to the idea of lurching off lichens, seaweed, and carrageen moss. But they maintain stoutly that these humble items aren't bad. They also speak well of dandelions, sea cucumbers, and mussels, though not of blue, or black, mussels, which can be poisonous during the summer in some areas.

On the subject of fish the instructors find it easier to convince the airman that he can survive with some pleasure in the Far North. They remind him that he can eat salt-water fish raw; the fresh-water ones (which may contain parasites) he had better cook (page 594). And if he manages to catch some Arctic inconnu he can consider himself blessed with a gourmet's delicacy.

Admittedly, it's not easy for a student airman at Stead to switch his mind from survival on ice and tundra to survival in the desert. Yet he's ready to concede that intercontinental bombers in a global war may traverse both types of terrain in a single day and that he may have to come down on either. He also recognizes that deserts cover nearly one-fifth of the earth's land surface.

It's enough to make any pilot's mouth dry just to listen to the facts about water and desert survival. At temperatures above 90° F., his instructors inform him, dehydration of 15 percent can prove fatal; the body needs from two to three times as much water in the desert as in the jungle—at least three to four quarts a day. If a man can't get it, he'll probably die.

But if he does have water, he can make it last longer and carry him farther by "rationing his sweat"—deflecting the sun with light clothing, traveling by night if at all, living in slow motion.

If he stays close to his plane, sets up signal devices (brush and oil beacons, mirrors, flares), and spreads out parachute panels, he can maximize his chances of being picked up (page 591). As long as he has stowed enough food and water on board, he'll be safe.

In short, the instructors point out, the time to lick the desert is before you take off.

On the afternoon of their third day at Stead student crews turn from the theory of survival in varied climes and tackle thorny reality in the near-by hills.

First they draw the supplies they need in addition to their E-1 kits: first-aid boxes, parachute panels, 10 bars of pemmican (dried meat), 3 pounds of fresh beef, and 3 pounds of root vegetables. The food won't be enough to get them through the trek in comfort, but it will tide them over until they learn to live off the land.

#### They Take to the Hills

At 9 p. m. they take off in a convoy of six-by-sixes. For 50 miles the trucks follow the highway from Reno. Then, at Honey Lake, California, they turn to the left and begin to climb switchback roads that lead steeply through ponderosa pine to an area of razor-backed ridges and narrow upland meadows.

Here the airmen will carry out a tactical exercise which for some will prove a lark, for others an ordeal, and for all a test. Simulating a jump over remote and rugged terrain, they will "bail out" of their trucks by crews, head into the tall timber, and for the next 10 days work their way cautiously across the training area to pickup points on the eastern side. They carry maps and radios. For more precise coordinates and new directions they must contact the base by radio each night.

South of Crocker Mountain the convoy cuts west to the Grizzly Valley road. Stakes indicating bail-out stations appear every four-tenths of a mile. As each crew nears its marker, its truck slows down for a moment, and in pitch darkness the men tumble out and make themselves scarce.



At this point many a crew makes its first and worst errors. Traveling through broken country at night is difficult enough even for trained men. For flyers quite out of their element it can be anything from a farce to a nightmare.

In charge of each crew is its aircraft commander (A/C). A regular Stead instructor accompanies him; but the instructor's mission is primarily to observe, to listen, to teach by correcting mistakes, and to appraise the A/C's talent for leadership and the individual crew member's capacity to survive.

If an airman suffers a serious injury, or the A/C gives an order dangerous to the whole group, the instructor can interfere; otherwise he allows his crew to determine its own course of action, right or wrong. This kind of teaching sticks with the students.

### Packing Through the High Sierras

It often happens, then, that the A/C will bail out with his bunch, look at his compass, mutter "Follow me, men!" and vanish into the scrub. He gives no instructions on trail discipline and night signals, doesn't check his contour map, doesn't arrange a rendezvous point for the first camp.

Result: his crew strings out behind him like a kindergarten class at a museum, contact is lost, and before he has gone half a mile he's short two or three men. Sometimes the instructor will round up the strays for him; sometimes he will just trail them, satisfy himself that they're getting along all right, and leave it up to the A/C to reunite his crew, if he can, and continue the trek.

For the purposes of this exercise, the A/C and his men must assume that the territory they're traversing is enemy-held. This means concealment, camouflage, caution. It means keeping to the woods and keeping off the logging roads that crisscross the area. It means few fires and small ones. It means sentries at camp and scouts on the trail.

Crews hopping off from Grizzly Valley road usually make no more than a mile before they bed down. They're up at dawn, however, to push deeper into the mountains and pitch a real camp.

Some A/C's take it slow and easy on that first day's trek. Others feel they must set some kind of cross-country record; as a consequence, by nightfall half their men may be nursing blistered feet or twanging tendons.

Next day, if the A/C feels he's hit upon a sufficiently remote and well-hidden camp site, he may set his men to smoking the beef they've brought. Using parachute panels, they build and cover a tepee of saplings (page 576), erect a rack inside, three or four feet off the ground, place the meat on it in strips,

and light a slow smudge fire of green wood underneath.

A few hours' smoking preserves the meat for a week or more, even in summer. If the smoke makes too obvious a beacon, the instructor will probably suggest that they do their curing by night.

For some crews the strongest incentive to living off the land is the pemmican they carry. Actually, this dried beef-and-pork preparation, which comes in aluminum-wrapped chunks, can be made very palatable if boiled long enough and supplemented with a vegetable or two, some greens, or, if a man is lucky enough to have it, a pinch of chili powder.

But many airmen, unimpressed by the pemmican's high protein content and persuaded that "a guy just can't stomach that greasy stuff," would rather forage for something else.

Before their trek is over, they are likely to have become pretty fair scroungers. They learn to make gill nets from their chute cords and set them at strategic bottlenecks in the creeks that fan out over the training area (page 594). Some discover the chilly art of stirring up the mud of beaver ponds with their feet and, with bare hands, catching trout as they are blinded by the muddy water.

Stead's training area contains few rabbits, but ground squirrels, ground hogs, chipmunks, and porcupines abound. The airmen make snares from ripcord wires, whittle figure-4 deadfalls, set baited traps, and then, with vast pride, skin and cook their prizes (pages 570 and 578).

### Porcupine in a Parachute—a Poor Dish

Appetite, of course, is the best sauce. Sometimes, however, even appetite balks at its task. One crew treed and killed a porcupine which weighed, after skinning and dressing, a good 15 pounds. Following instructions, they wrapped it in parachute cloth, soaked it overnight, and roasted it.

Unfortunately, it turned out that their chute had been warehoused in naphtha flakes. The flavor it imparted to the porcupine had to be tasted to be believed.

Even airmen with considerable camping experience can pick up many pointers from their instructor as the days go on, and remind themselves of much that they have forgotten.

They learn to avoid trichinosis by cutting doubtful meat into bite-sized pieces and cooking it thoroughly; to treat frostbite by thawing or warming the affected areas rather than by applying snow or ice; to lay out shadow signals for rescue planes in snow-covered terrain by digging trenches, lining them with spruce boughs, and piling snow highest on the south side of the letters (pages 591 and 602). They





### Capt. Willie Knutson, an Experienced Arctic Explorer, Instructs a Survival Class

Few if any downed flyers would have ready-made snowshoes and tents in their survival kits. From teachers like Knutson they learn how to improvise. One diagram explains shelters and traps; another takes aim on a rabbit.





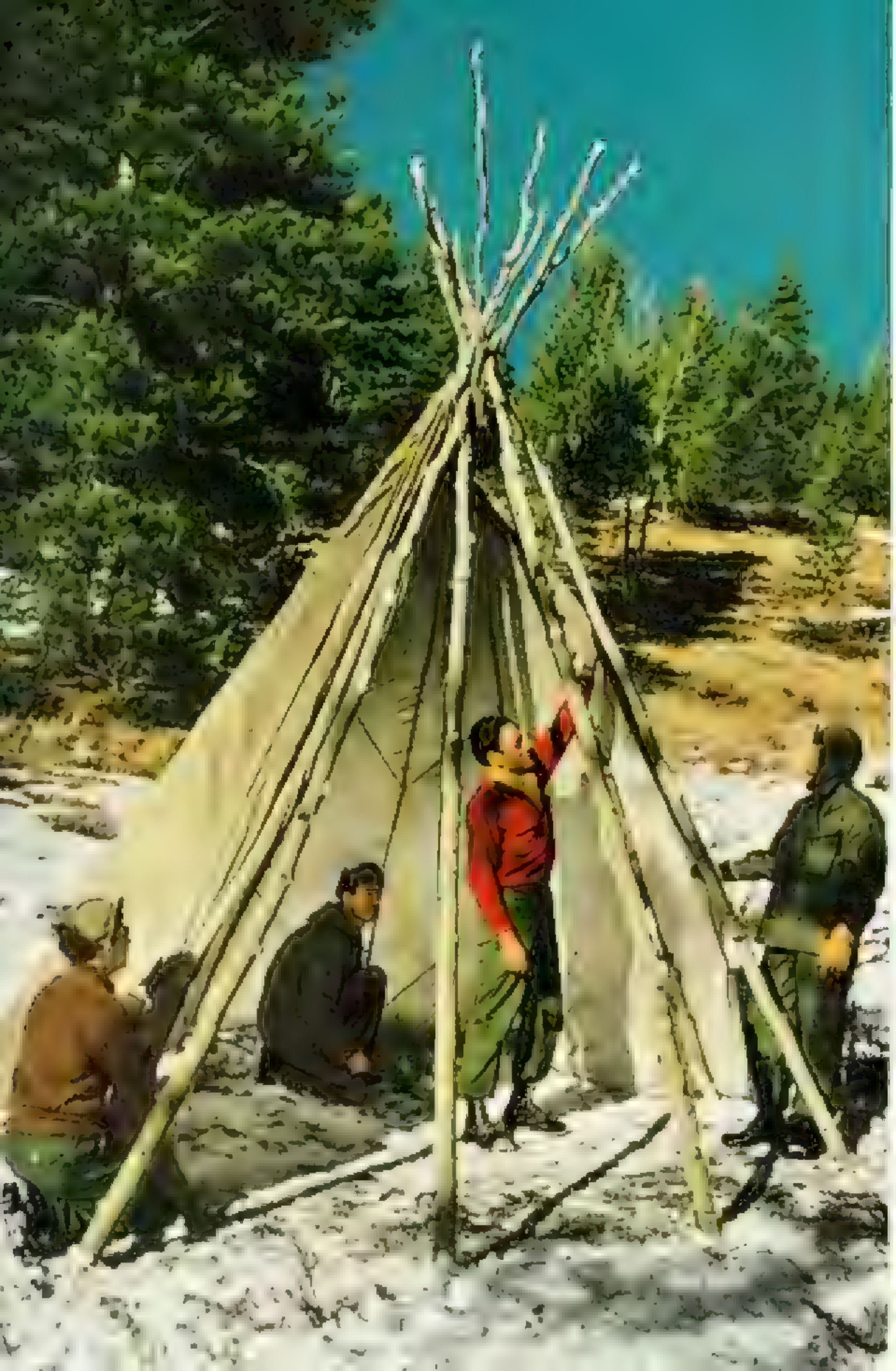


Patchino Students at Camp Carson, Colorado, Learned to Keep the Wind from Blowing Their Hats Away

Students at Camp Carson, Colorado, learned to keep the wind from blowing their hats away. The students are shown in the foreground, and the camp buildings are in the background.











### ★ This Springy Bed Requires Only Trees and Hatchet

Barrett found out that a new type of springy bed could be made from the bark of trees and other things found in the forest. These beds are made from the bark of trees and other things found in the forest and are very comfortable.

### ★ A Wooden Tureen Boils Without Fire

The boys found a way to make a wooden tureen that could boil without fire. They used a special kind of wood and a special kind of water. Some say it is a magic trick, but it is really a science.

### ★ 14 Panels of Parachute Will Cover a Paratrooper

There is a new kind of parachute that is made from 14 panels. It is very light and easy to use. The boys found out that it could be used to cover a paratrooper.

They also found out that the parachute could be used to cover a paratrooper. It is very light and easy to use. The boys found out that it could be used to cover a paratrooper.

The boys found out that the parachute could be used to cover a paratrooper. It is very light and easy to use. The boys found out that it could be used to cover a paratrooper.

© National Geographic Society

Published by the National Geographic Society  
Washington, D.C.















580

How to Use the Stretcher in the Emergency Room

#### \* This Stretcher Ride in Miniature Looks Like a Thrill to Be Avoided

Patients in the emergency room are often in a state of shock and confusion. They are often in pain and may be unable to move. The stretcher ride in miniature is a thrill to be avoided.

#### \* Of All This Emergency Gear, Extra Sticks May Prove Most Vital

A study of patients in the emergency room has found that the most vital piece of equipment is the extra sticks. These sticks are used to hold the patient in place and to prevent them from moving around the room.









1. **Stylized Text:** The text "STYLIZED TEXT" is written in a decorative, outlined font.

Many a Democrat in  
 the late thirties added  
 to the record by  
 making a record in  
 the thirties and forties  
 by voting against  
 the New Deal.

2000年12月25日  
 星期五  
 晴  
 2000年12月26日  
 星期六  
 晴  
 2000年12月27日  
 星期日  
 晴

• **Steps for Site Setup:**  
 1. **Site Assessment:** Conduct a thorough site assessment to identify potential hazards, environmental conditions, and existing infrastructure.  
 2. **Permitting:** Obtain all necessary permits and approvals from local, state, and federal agencies.  
 3. **Site Preparation:** Clear the site of debris, vegetation, and other obstructions. Establish access roads and utility lines.  
 4. **Infrastructure Installation:** Install temporary and permanent infrastructure, including roads, bridges, and utility lines.  
 5. **Construction:** Begin construction of the project, following the approved plans and specifications.  
 6. **Monitoring:** Monitor the construction process and site conditions to ensure compliance with regulations and safety standards.  
 7. **Completion:** Complete the construction project and conduct a final inspection to ensure all requirements are met.

For information, please  
contact the author at the  
address below. All other  
correspondence should be  
sent to the publisher.  
The author's address is  
10000 University Avenue,  
Suite 100, San Diego,  
California 92121, U.S.A.  
Tel: (619) 594-9200  
Fax: (619) 594-9201  
E-mail: [info@wiley.com](mailto:info@wiley.com)











are told how to build a shelter from soft, deep snow—tamp the snow evenly with snowshoes and allow it to freeze overnight before cutting into blocks (pages 306 and 387); how to find "Indian kerosene" in dead pitch-filled evergreen branches.

A damp sleeping bag can be dried in winter without a fire, they learn—let it freeze stiff outside the tent, then knock off the frost and ice crystals with a stick.

To rig a trap set, the men are instructed to place the snare on a game trail along a slope or stream so that the weight will fall far enough to hoist the animal out of reach of hijacking predators.

Safety pins, they discover, can be made into gables for a willow fish pole, and a key-type can opener can be set in wood and sharpened into an awl, unwound and given a needle point, flattened into a screw driver, or bent into a fishhook.

Most campers, no matter how experienced, know little about woodland plants as food. They haven't had to find out. Yet, as Stead's instructors point out, the rules, at least for the North Temperate Zone, aren't hard to remember:

Flowers of all plants are edible either raw or cooked.

Almost all fruits, nuts, and berries are edible (the most common exception is the hawberry).

Leaves and stems of nonpoisonous plants can be eaten raw, or, if too bitter, boiled in several changes of water.

Roots, tubers, shoots, and rootstalks should be roasted, baked, or boiled.

#### Why Not a Venison Dinner? Too Easy!

With plenty of deer in the training area, some crew member is always sure to ask why he should bother with "rabbit food." Why not venison? The answer, of course, is that it would make survival all too easy, at least until the deer were badly thinned out.

One hindquarter of deer would feed a whole crew for the duration of its trek. They would not only waste the rest of the animal but would never learn to experiment with other food sources.

Though the airmen are not all well actually to shoot or trap or butcher a deer, they are taught how to go about it (page 372). They practice setting the simple, reliable Apache

foot snare; they construct the lethal deadfall with three-pin trigger. They also pick up the essential principles of stalking game: keep off the skyline; keep the wind in your favor; and search the terrain in all directions, preferably with the sort of monocular that comes in the E-1 kit.

Trial hunts reveal that the airmen's chances of stumbling upon game are pretty remote and that they will have to go out and spot it before they're spotted first. The Hornet rifle they'll ordinarily carry is only .22-caliber, clearly, in order to bring down any sizable animal, they will have to get to fairly close quarters.

#### Instructors Are Trained Men

These things they learn partly by doing, partly by talking with the instructor. In their 10-day crossing of the area they average about five miles a day; usually it means the pitching of half a dozen different camps. There's plenty of time, between chores or along the trail or around the fire at night, to chew over the day's successes and fiascos and to cross-examine the instructor on survival technique.

That instructor is likely to be a pretty unusual man. Chances are he'll be a non-com, a staff or tech sergeant. Yet he will have had at least two years of college, many years of outdoor experience, and highly specialized training in survival work.

More important, the instructor will possess the poise and judgment necessary to lead, through a grueling trek, a \$3,000,000 crew, whose commander may be a lieutenant colonel. He'll indoctrinate them with specific wilderness lore and with a healthy attitude toward stress itself, and, at the same time, coolly appraise the survival efficiency of each crew member from the V-C down. That takes quite a man. SAC is lucky to have found and developed as many as it has.

After handling a score of crews, an instructor at Stead is not easy to surprise. He no longer chokes when he encounters some crew member who has never seen a live cow. He begins to expect that one or more out of every two or three crews will bed down in the middle of a game trail and wake up to find as the next night comes on down the path and bundle his sleeping bag.

The instructor even becomes inured to the fact that the crew's navigator will almost certainly manage to get lost. Every crew automatically turns over its navigational problems to its "pro"; and the pro, bereft of the nifty tables and charts that made his flying efficient, is every much more prone to lose his crew on a week's tour around Robin Hood's bay. Then some rank amateur of a ground

#### CHAPTER 10

#### 4 A Hole Chopped in the Ice Yields Dinner for Two

Emergency fishing gear packed in a survival kit may be used in tropical or Arctic water, as freshwater. These SAC trainees from Catap Canyon use their kit's hook to jig for fish in the South Platte River.



or a flight engineer takes over, fishes out his Weems plotter and his reop, and gets the group back on the right track.

An instructor can be amused by his crew's naivete, but occasional specimens try him sorely. These include the officer who balks at true discipline and tries to pull his rank on the instructor; the A C who finds himself befuddled by the unfamiliar problems of mountain survival and traces his leadership to self-pitying apathy; and the airman who discovers when the going gets rough that he is sick and should be evacuated at once.

A frequent complaint of crew members who "want out" is altitude sickness, caused by low oxygen pressure. Like all SAC flyers, they've been thoroughly briefed on the physiology of high flight and the dangers of oxygen deficiency. It's natural enough that when they begin to pant up and down the Sierra Nevada at 6,000 or 7,000 feet, usually a bit hungry, tired, and pack-sore, they should note in themselves persuasive symptoms of mountain sickness.

From then on, unless the instructor or a medical corpsman can snap them out of it, they're likely to become increasingly convinced that the strain is building up, that pressure on the heart is growing, and that they're about to black out.

#### Shrewd Medics on Duty

Fortunately, the school maintains some roving medics up in the area who are both sympathetic and shrewd. They can spot a malingerer at 50 yards, and they can tend to a real cardiac case with certainty and dispatch.

These medics have one advantage over doctors down at the base: they know from intimate experience what the men are up against, because they live up in the Sierra Nevada most of the time. They know that while a trek in midsummer can be merely a pleasant outing for a good camper, in winter and rough weather it can be quite an ordeal for a tyro.

Hiking up let a heavy pack with a pulled tendon can become excruciatingly painful. Fighting through snowdrifts when you're wet, lost, and underfed is not necessarily fun; and criffs in the area can reach 20 to 25 feet.

Rugged days, sleepless nights, below-zero cold, the responsibility for a dozen other men under unfamiliar conditions—these can erode the morale of many an A C who never had any trouble running his crew before.

SAC's medics and instructors, indeed, tend to be less surprised at the number of men who crack up during the trek than at how many do not. They remember the officer last summer whose soles were simply strips of

raw, blistered flesh but who nevertheless led his crew out of the area under full pack.

They remember the airman with severe abdominal pains who was brought almost forcibly up to a medical post, was diagnosed as having appendicitis, yet insisted on returning to his crew. Only when they drew up a paper for him to sign, absolving them of all responsibility for his death, did he agree to go down out of the hills. He was on the operating table in an hour—and, literally, not a minute too soon.

#### Some Radios Are Disabled

The tenth and last day of the trek finds most crews camped near the final ridge on the eastern flank of the training area. The majority have been able to maintain nightly radio communication with the base and receive the exact coordinates for their pickup.

A few, however, have damaged their transmitters, dropped their generators in some stream, or discovered that, when their crew split up, the generator carrier went one way and the transmitter man another. Such crews will be picked up anyway, their instructors having been given the rendezvous directions before they started. But the men responsible will be downgraded for an error that, under actual survival conditions, might have cost them their rescue.

To some crews the end of the trek comes as a huge relief, to others as a blow. But all of them, tanned, bristle-bearded, their boots dusty and their fatigues greasy, seem to stride along now with the slouchy assurance of veterans.

Those who hit the last crossover ridge in summer must contend with rattlesnakes frolicking on the exposed ledges (one crew killed 25 and captured two). Those who meet it in winter must clamber down a 2,500-foot jabside lobby-trapped with snowslides. Yet because they know they are coming down the homestretch, they somehow have a jaunty air.

#### Know Thyself—and Thy Crew

They have learned how to pace themselves in rugged terrain, how to care for their only means of locomotion, their feet, and how to use the equipment they carry. Most of all, they have learned how to improvise and how to help Nature to help them.

They have learned, too, a lot about each other. They have found that Joe, the bombarder who never had much to say, is the one they can depend on to bring home the bacon or the snatched ground hog. They have discovered that Bob, a fine radarman aloft, can get lost on the ground more quickly than any of them. They have come to realize that the Old Man is the kind of guy who can walk



[illegible]

Snowy Muscovy Duck in the Wild at an Igloo at Sand Air Force Base  
An Eskimo on a snow-covered beach. Below is a picture of a snowy landscape with trees.

if  $\Gamma$  is a  $\mathbb{Q}$ -linear combination of  $\mathbb{Q}$ -linearly independent elements of  $\mathcal{C}_\Gamma$ , then  $\Gamma$  is a  $\mathbb{Q}$ -linear combination of  $\mathbb{Q}$ -linearly independent elements of  $\mathcal{C}_\Gamma$ .

Before they went to the training area, we were asked to pick up the names of 110 new recruits, with whom they would meet some of the training. (The first 100 of us are given the same form to fill out, usually a case table for under some category.)

Because the frequency of the  $H^b$  allele is high in the population, the probability of finding a  $H^b$  allele in a sample of 1000 is high. The probability of finding a  $H^b$  allele in a sample of 1000 is high. The probability of finding a  $H^b$  allele in a sample of 1000 is high.

$\int_0^1 \frac{1}{x} dx = \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{k} - \ln n$

[illegible]

The institute for research on the effects of alcohol and drugs on the crew of future submarines is a ship-mounted stress, training discipline ground operation, outperforming 100,000 of the best.



care and use of clothing and equipment, outdoor craft, health, attitude, physical condition, and parachute evaluation.

Each of these categories, moreover, is broken down into many subheads. Take outdoor craft. The instructor must size up the crew member on selection of camp site, erection of shelters, emergency fire methods, improvising in the field, skill with ax and knife, proper firewood, ropes and knots, and sharpening hand tools.

Or take leadership, the criterion SAC considers most important of all in appraising an A-1. We want to know how well he utilizes his man power. Does he brief his crew? Show resourcefulness? Instill confidence and respect? Exhibit calmness under stress? Take an interest in his crew's welfare and morale? Survey new situations accurately? Plan and organize? Maintain control?

#### The Commandant Sounds Off

We don't, of course, expect a perfect score from every aircraft commander. But those who fall can look forward to reassignment. Conversely, those crewmen, no matter what their rank, who indicate a marked aptitude for leadership can be sure their initiative will not go unnoticed. The school's evaluations become a permanent part of every airman's record.

The crews get the good—or the not-so-good—news about their ratings in a special critique. There, in the space of an hour and a half to two hours, the head of the training squadron relentlessly reviews their sins as well as their successes.

On rough-hewn log benches the men sit in groups, each crew somehow a little tougher than before. A little more conscious of its own identity. Some of the men are in blue jeans, some wear baseball caps or sombreros. A few proudly finger their week-end whiskers.

The commandant begins in jocular vein.

"Gentlemen," he's likely to say, "I congratulate you. You made it. I know many of you didn't think you would, and some of you didn't care. You didn't ask to be sent here, and it didn't make you any happier when they took away your nice room and your soft bed and dropped you out in the ticks in the middle of the night and told you to start running."

"Your morale went bump, and you wanted to tell the whole Air Force. Okay, gentlemen, you can have your wings and your saddle and get back. I want out."

"But you kept in there plugging, most of you, and you came through, and you learned something, partly about yourselves and partly about the woods. Perhaps what you learned about yourselves will prove, in the end, to

be the more important to your eventual survival."

This tactical exercise you've completed was tough. At times, I have no doubt, you experienced a flasher or two of fear. But let me remind you that the real thing will be ten times tougher. You may be seriously injured when you ditch or jump. You may be wounded before you ever leave the plane. You may come down in hostile territory with patrols bounding you day and night. Above all, you will have no certainty that you will be rescued in 10 days—or 10 months.

In short, you will become acquainted with your greatest enemy, not hunger, not climate, not terrain, but fear. Fear can paralyze you into passive acceptance of your fate or it can shock you into panic.

Neither, however, if you remember the principles of survival, face the facts, make a plan; keep busy; and keep trying. In short, your one dependable antidote to anxiety will be purposeful activity."

The commandant pauses. The upturned faces below him are thoughtful enough, some of the crews will be over Korea in a few weeks, practicing, perhaps, what they now hear preached. The speaker turns to his notes.

#### Outdoor "Surgeons" Operate on Selves

"Before I give you your ratings, let me run over a few points on your woodmanship. You appear to have been an average class. The chief medical officer warned you that the hunting knives you would carry were sharp, and that testing the blade against the left forefinger was not recommended. I observe from your instructors' reports 37 cases of laceration of the left forefinger."

They laugh. Uneasily, one or two put their hands in their pockets.

"As to navigation, you seem to have picked up some of the notions beloved by other classes, such as the belief that the best way to travel due east is to walk along keeping the sun always on your right. Around noon-time, I imagine, you found it more than a little difficult."

"Others of you, I hear, felt sure that the shortest distance between two points is always a straight line, regardless of those little contour marks on the map. You fellows who encountered a mountain between your two points may have begun to wonder if Archimedes had ever done much cross-country hiking."

"On camouflage, I note in some cases an excess of artistry over common sense. I am thinking of one particularly touching spectacle I witnessed this week up in the training area. There, walking down the road a broad





## A Podulera Abandon a Ditched C-82

It was a surprise to find them on a yellow boat. The men from the Navy were not in the boat, but the men from the Army were. The men from the Army were the ones who had been in the boat. The men from the Army were the ones who had been in the boat. The men from the Army were the ones who had been in the boat.

The men from the Army were the ones who had been in the boat. The men from the Army were the ones who had been in the boat. The men from the Army were the ones who had been in the boat.

A man from the Army was the one who had been in the boat. The man from the Army was the one who had been in the boat. The man from the Army was the one who had been in the boat.

The man from the Army was the one who had been in the boat. The man from the Army was the one who had been in the boat. The man from the Army was the one who had been in the boat.

The man from the Army was the one who had been in the boat. The man from the Army was the one who had been in the boat. The man from the Army was the one who had been in the boat.

—Navy and Army men from the Navy

—Navy and Army men from the Navy







Normal Inspection note

501

### Parachute Canopies and Rod Walls Make a Hut, and Willow Branches a Mattress

A. This man is working on the hut. The canvas canopy of a parachute is being used for the roof. The man is using a rod wall to support the canopy. The man is also using willow branches to make a mattress.

B. Separated from the hut, the man is working on the mattress. He is using willow branches to make a mattress. He is also using a rod wall to support the canopy.











National Geographic

592

# \* Vietnamese Men dug on an Ancient Island Sample Seabed Sandwort and Find It Edible

It is said that the first Vietnamese people came to the island from the mainland. They found a white tuberous plant growing in the sand. They dug it up and ate it. They found it was very good to eat. They found it was very good to eat. They found it was very good to eat.

The tuberous plant is called beach sandwort. It is a very good food. It is a very good food. It is a very good food. It is a very good food. It is a very good food. It is a very good food. It is a very good food. It is a very good food. It is a very good food. It is a very good food.







561

ARMENIAN FARM, Y. I. I.

### "Gone to Earth!" But Not for Long—Armenians Dispossess a Red Fox

It has been said that the fox is a cunning animal, and indeed it is. But in the case of this fox, it is all for a good cause. The fox, which is a member of the family Canidae, is a member of the family Canidae, and is a member of the family Canidae.

Every fox has its own way of life, and it is a fox that is a fox. It is a fox that is a fox, and it is a fox that is a fox. It is a fox that is a fox, and it is a fox that is a fox.









## Flyers Learn How to Stay Dry in Water

Men in the field are on the edge of the water, and the water is deep. They are in the water, and the water is deep. They are in the water, and the water is deep. They are in the water, and the water is deep.

The water is deep, and the water is deep. The water is deep, and the water is deep. The water is deep, and the water is deep. The water is deep, and the water is deep.

The water is deep, and the water is deep. The water is deep, and the water is deep. The water is deep, and the water is deep. The water is deep, and the water is deep.

The water is deep, and the water is deep. The water is deep, and the water is deep. The water is deep, and the water is deep. The water is deep, and the water is deep.

The water is deep, and the water is deep.











## Jimmy Flanagan Escaped Execution

This new story in the Atlantic is said to make a man of the circus king. But Flanagan is a man who has been in the circus for many years.

Flanagan, whose first experience was a pleasure in the circus, was the first of the circus men in America. A circus man, he was a man who had been in the circus for many years and had been in the circus for many years.

After all, Flanagan's story is a story of a man who has been in the circus for many years and has been in the circus for many years.

By the way, the story is







1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

5. 1. 1994

**One Trout in the Net Is Worth Ten in the Willow Bush**

[illegible]

It is important to note that the model is not intended to be used for the purpose of predicting the outcome of a specific case, but rather to provide a general overview of the factors that may influence the outcome.







## Counting Crabs by Radar in the Aleutians

Aleutian crab counts are the most accurate in the world. They are the only ones that are not based on a single day's catch.

An annual count is taken of the number of crabs caught in a trap in the north of the island. A second count is taken in the south.

The results of the two counts are compared to determine the number of crabs that are caught in the north and south. This gives a more accurate picture of the total number of crabs in the island.

Source: U.S. Fish and Wildlife Service, Alaska Department of Fish and Game









daylight, was a beautiful little Christmas tree—in GI boots."

Turning to a blackboard behind him, the commandant pins up a large chart; on it is a graph outlining the combined scores of all crews in the present class. Then his assistants hand out the individual and group ratings to the crews themselves.

They are, as the commandant has estimated, a pretty average bunch. Very few of them have failed the course; very few of them, too, have made a top score. Perhaps more significant than their marks, however, are the statistics indicating their growth in confidence. When they arrived, nearly a fifth rated themselves as "inadequate for individual and group survival." Now, at the end of the course, that ratio has shrunk to a handful.

### Course Pays Off in Combat

The newly gained assurance which these crews manifest isn't misplaced, either, according to intelligence reports from Korea. About a third of SAC's crews have now gone through the course at Camp Carson or at Stead, plus trainees from other commands, and many of these crews have flown out to the Far East for a tour of battle duty.

Though bomber losses in Korea have been relatively light, and no definite conclusions are available, a significant number of fighter and fighter-bomber pilots have come down in enemy territory and have brought their SAC schooling into play.

Their comments on reaching our lines have furnished eloquent testimonials to their training.

"The stuff they taught me at SAC sure pulled me through," declared one. Said another: "It was rugged, but I never felt helpless. I knew what to do, and I did it, and I just never left myself time to get scared." A third asserted: "I remembered what I'd learned at Stead, and I kept cool, kept going—and kept my socks dry."

One of the most telling examples of what even a smattering of survival knowledge can do for a downed crew is the experience of the "Goose Bay Gang."

This contingent consisted of a B-50 bomber crew and passengers flying back to Tucson in September, 1950, from a field at Goose Bay, Labrador (map, page 569). They were about 110 miles due west of Goose Bay when three of their engines failed. They jumped.

It was an exceptionally good jump. All 16 men left the plane from about 1,700 feet at around 10 p. m., the pilot last. They came down in the spruce scrub and marshes within an area no more than four miles in diameter.

As they stowed their chutes and rendez-

voused, they found that with the exception of one man who had broken his leg everyone was in condition to walk.

The aircraft commander was a young first lieutenant, Jack Thompson. He was well out-ranked by several of his passengers, but he accepted his responsibility for leadership unhesitatingly and made it stick. He and his crew had completed elementary survival training at their home base, and he had asked for and received a two-hour briefing at Goose Bay on living off the land in the Far North.

Taking a rapid inventory, Thompson discovered that no one had been able to bring down any emergency equipment. Two men had 45's; each man had his parachute. That was all. The radio in the plane had failed at the same time as the engines, so that the operator had had no chance to send an SOS. They were lost, and there was no telling when, if ever, they would be picked up.

Thompson didn't give them time to sit around and brood. He put several of the men to work pitching paratepees, others he detailed to gathering spruce boughs for flooring; still others he sent to forage for food and firewood. The injured man he placed in the first tent that went up, with a tough squad on his leg and a 24-hour guard to look after him.

The food detail reported no big game but plenty of cranberries and blueberries still edible. One of the hunters shot a small bird. Scouts reported a river only a few hundred yards away.

Next morning, with the group's most immediate needs having been met, Thompson had a detachment begin construction of a raft. The men had no axes or hatchets, but they pushed over dead spruce trunks and rolled them down to the river. There they lashed them together with ropes made from their chute shrouds. Another unit looked for a signal in a clear, snowy space. "No—OK" while others laid smoke beacons of crisscrossed branches (page 602).

### Needle in a Northern Haystack

For three days Thompson's crew waited and worked. It was no picnic. One man found he had fractured his ankle on the jump; another that he had chipped a bone in his foot. Neither of them wanted to fold up, but both were pretty well hobbled. As for the others, they tried to do what Thompson asked—forget their long-range prospects of surviving a Labrador winter and concentrate on doing a job.

Meanwhile, a joint U. S. and Royal Canadian Air Force hunt had been in progress for 72 hours, searching the missing B-50's route, map square by map square. The hunters had





102

### Airmen Stranded in the Labrador Wilderness Signal "16 OK" to a Rescue Helicopter

On September 21, 1966, 16 flyers parachuted from a de Havilland DHC-6 Twin Otter west of Goose Bay, Labrador, Canada. Employing survival training, they built shelter, set signal fires, and imitated a moose. Within 24 hours, a rescue team found them in the dark, cold, and desolate wilderness. The rescue team, which was sent to find them, was led by a pilot who was also a member of the team. A search for the missing and a rescue mission to find them was underway.

not fire for help. They had no idea when the plane was going down, or where it was. They were not even sure of all reconnaissance, could be expected to do.

Within 24 hours, Sunday afternoon, a rescue message came in from a Canadian search plane; smoke signals had been sighted. At once a rescue team was dispatched. Over the target area survival experts plummeted into space and chuted down to Thompson's men. Medical supplies, food, and other equipment followed.

#### Helicopter Aids in Rescue

Next day a helicopter began swarming the men to a lake 12 miles away, where a pair of amphibians picked them up and flew them back to base.

What did all this prove? Not that Thompson or his men had become accomplished outdoorsmen. Matter of fact, they had made many mistakes or omissions, not the least of which was their inexcusable failure to fish for or set gill nets. The river they were about to embark on with their raft ran in

the wrong direction; it would have taken them even farther from civilization.

But Thompson, whose indoctrination in survival had been limited to base-level training and a two-hour check-out at Goose Bay, showed that the essential principles can be quickly grasped and that the adoption can mean the difference between productive persistence and group collapse. He kept the energy and imagination of his crew focused upon purposeful, practical activity. He left no doubt where the leadership was vested, yet he made it plain, too, that the full cooperation of each was vital to the success of all.

With more training, Thompson and his men could have done better. But they gave solid evidence of how far even a little knowledge can take a bunch of novices and of how much we can expect from the really well-schooled deer. We are now graduating each fortnightly from Stead.

Other accounts in the *National Geographic* Magazine of survival training are "Survival Training: A Search on a Pacific Atoll," by John McPhee, *National Geographic*, January, 1968, and "The Survival of the Fittest," by John McPhee, *National Geographic*, February, 1968.



# American Wild Flower Odyssey

603

A Lifetime's Search Covers Deserts, Mountains, and Lowlands;  
Travels Range from Maine Orchards to Texas Cacti.

By P. L. RICKER

*President, The Wild Flower Preservation Society*

*With 28 Color Illustrations by the Author*

**D**URING the past 60 years I have traveled some 150,000 miles to study and photograph wild flowers in almost all parts of the United States.

This lifelong interest in a form of Nature almost infinite in its beauty has taken me by land, canoe, Luckboard, automobile, train, and on foot to cold and storm-swept mountain summits, barren deserts, sinister swamps, lush meadows, and woodlands.

In all these places, and many more, wild flowers display in season their amazing variety of color and form. All year round, through cycles of growth and rest, they demonstrate Nature's almost unbelievable adaptability to environment.

A fossil fern, displayed in a piece of rock on my Maine grandmother's parlor whatnot, first aroused my interest in Nature. As a small boy of 7, I was forbidden to touch it. No one could tell me about it, so I borrowed a book on fossil plants from the public library. It proved so fascinating that botany in general and wild flowers in particular have served me as a lifelong profession and hobby.

## Flower Hunting Often Exciting

Tracking down a "lost" or elusive wild flower is as exciting to the botanist as a search for wary game is to a hunter.

A case in point is the box huckleberry. It was originally found in Virginia between 1800 and 1805 by three botanists, but after they died the locality was lost. In 1845 it was found in New Jersey. In 1921, more than 100 years after its Virginia locale was lost, the Reverend Fred W. Gray, an amateur botanist, observed the plant near Derr, West Virginia, not far from the Virginia border. He learned that locally it was known as juniper berry, and in a few weeks, through newspaper advertising and correspondence, discovered more than 75 localities of the plant.

Later I searched for box huckleberry with friends along a stream between Annapolis and Baltimore, Maryland. Finally, after two days of hunting through thick stands of mountain laurel, we found it. The exact location must remain a secret, for the plant is much sought as a decorative shrub, and this small stand might be destroyed.

Another kind of adventure sometimes accompanies the search for wild flowers. Nearly 50 years ago a friend and I were studying plants and wild flowers in the Okefenokee Swamp in southeast Georgia. Poisonous water moccasins were so thick that our guide, wearing heavy knee-high boots, walked ahead, killing snakes with a machete.

Once, as we pulled our boat ashore, the guide reached toward a hole in a cypress stump. At the same moment I saw something move within the cavity. Quickly I emptied my revolver into the hole, and a fatally wounded moccasin slowly emerged.

Another time, while I was botanizing with friends in the woods of western Pennsylvania, a member of the party bent down to pluck a May apple. Suddenly he straightened up, yelled, and fled down the trail. A big rattlesnake was coiled completely around the stem of the flower!

When an angry bull objected to my photographing a large field of several kinds of wild flowers near Bozeman, Montana, I had to toss my camera hastily into a thicket and make for a handy tree.

In general, however, the pursuit of wild flowers is infinitely less dangerous to man than are man's activities to wild flowers.

## As Nation Grows, Flowers Vanish

The spread of civilization across North America rapidly destroyed the flowers that once were abundant. Some species even may have become extinct. A century ago railroad surveyors and early settlers on the Great Plains reported vast stands of colorful wild flowers covering the land for miles. Today most of these species are rare.

Saving America's wild flowers from destruction and promoting enjoyment of their beauty are the principal objectives of the Wild Flower Preservation Society.\*

To help inform travelers of the most interesting and colorful flowers to be found in

\* Leaflets listing wild flowers that need protection are circulating how to establish wild flower preserves and transplant flowers to preserves from areas that are to be cleared may be obtained by sending 20 cents in coin (not stamps) to the Wild Flower Preservation Society, 4040 Oliver Street, N. W., Washington 15, D. C.





After all so far, I am variously surprised how few people visit the country during several recent summers, both to see the flowers at first hand and to collect their beauty in color photographs.

### 200 Species Described

Space permits the mention of but 200 species of wild flowers, out of the more 2500 species of wild flowers found in the United States. More would have been listed if the species would have taken text space than is available in this issue of the *NATIONAL GEOGRAPHIC*.

In this article I have endeavored to include those flowers that are most representative of our flora and to include a few of the more familiar flowering trees and shrubs. They are mentioned more widely by the more careful collector. Scientific

names may be found readily by those who desire in any good regional reference work on wild flowers.

To photograph wild flowers I use a 35 mm. lens reflex camera and an exposure of about one tenth of a second at f 8 to f 24, the exposure and aperture being used to show the natural color and associated details. Some preliminary lenses provided information when needed.

On a sunny August day at Acadia National Park in Maine. Climbing up through the woods and over the side of Cadillac Mountain one fine day we were apparently greeted by the dwarf coral of *Polysiphonia* with its showy white leaf-like fronds surrounding the tiny, inconspicuous greenish purple or violet star flowers cupped to us.

Nearly spread carpets of white false foxglove called *Antennaria* flowered in



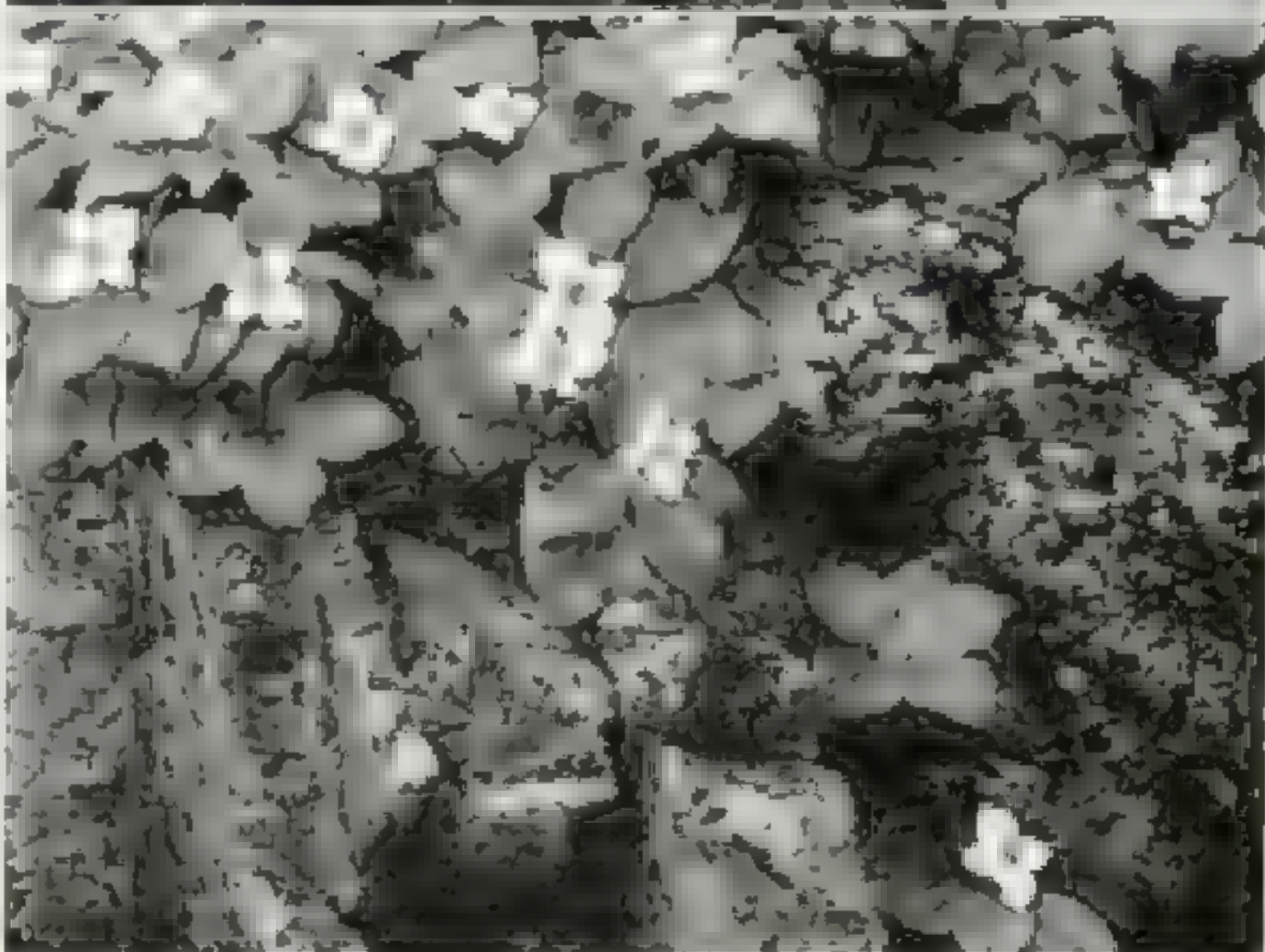
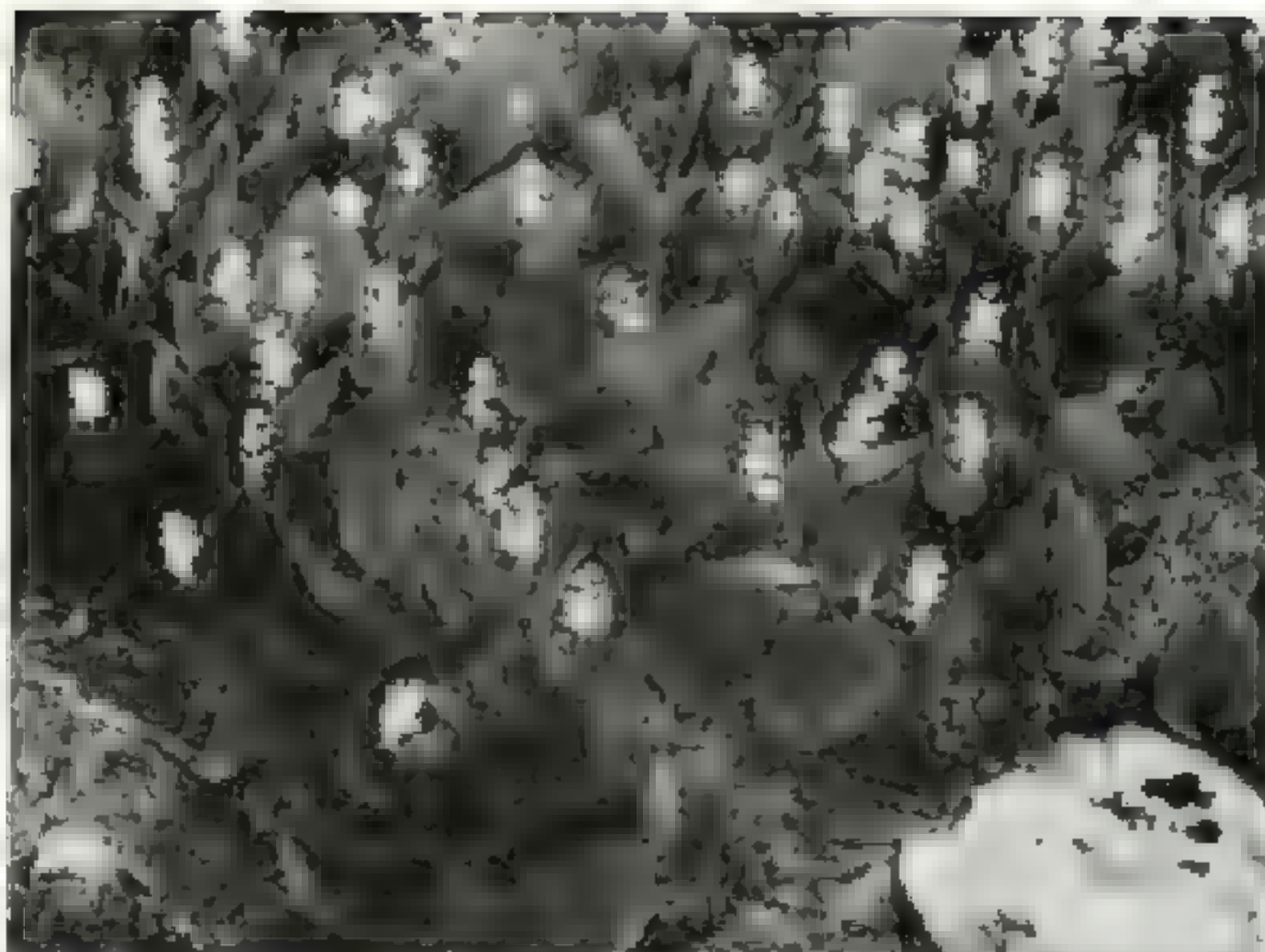
- Mount Desert Island, Maine, Start of the Wildflower Odyssey

The author of the book is a well-known and respected figure in the field of international law. The book is written in a clear and concise style, making it accessible to a wide range of readers. The book is a valuable resource for anyone interested in international law, and it is highly recommended.

"When we're in the middle of the election, we're not in a position to get ahead of them on issues," says a senior State Department official. "We're not in a position to say anything about the Soviet Union. The only way to do that is to wait."

For clarity, we have numbered the axes,  $x_1$  through  $x_6$ , in order of increasing frequency. The  $x_1$  and  $x_2$  axes are the most important, and the  $x_6$  axis is the least important. The  $x_3$  axis is also important, but the  $x_4$  and  $x_5$  axes are less important. The  $x_6$  axis is the least important.

The following is a brief description of the data used in the study. The data was collected from a survey of 1000 respondents. The survey was conducted in the United States and included questions about the respondent's age, gender, and education level. The data was then analyzed using a series of statistical tests to determine the relationship between the variables.



1.1.1.1

and I walked and hunted from 10:00 AM to 12:00 Noon. There and then we saw the look of water, rivers, or rapids, the sky, and the forest. Because the sky is not of the blue, forest by two wings of birds, somewhat resembles a large bird.

Angled bar and at Chidlow we saw a few of the magnificent flowers of the honey-suckle growing over the trees and over the houses at Miv and from our camp near Newcomb and Chidlow south to Perry's pond.

✓ Printed Text & Images: *Journal*

For the plant in a near-by bog where the condition was poor, it was found that the plants were probably subjected to drought stress. The percentage nitrogen fixed by the roots of this plant was 10.4, which was 25% greater than the value recorded for plants in the bog.

<sup>3</sup> *Journal of the American Statistical Association*, 1990, 85, 1001-1014.

The model for the first studies there, using a few dozen rats, showed that the rat has but one presented form of learning, a spatial response, and is doing the best. The second study, in the United States, showed that the best response is the extension of the spatial pattern of learning.

There is a need to be involved in giving the community information about what is going on with the program and the people involved.

Along the gravelly bank of Mount Desert Island, many small rounded boulders with smooth, siliceous, laminar surfaces occur. Some of these boulders consist of heavy, sandy loams or are composed with a very porous, light brown, siliceous loam.

of 1971 was the first such paper.<sup>1</sup> It was the first paper to combine with the structure of Merton's yet those behavioral theories known for the first time direct modeling with complex Cartesian. It was also the first to include first-order in the





TRIMBLE, N. Y. Forest Service.

### Flowering Dogwood Brightens the Spring Landscape from Maine to Texas

For her beauty, the white flower is rivalled by the plant's red autumn foliage. Virginia and North Carolina produce some of the finest flowering dogwoods in the country.

late Olaf O. Nylander, a Swedish naturalist. Mr. Nylander, then 80, and I had corresponded 30 years earlier, when I was a student in Sweden.

Most common of all the orchids we found was the small, round-leaved orchid, with its spikes of two or three slight, rose flowers about half an inch long and a white lip dotted with purple. Near by grew green and white round-mouthed and leafy species of water, green and greenish-yellow striped orchids.

### Arctic Plants on Mount Katahdin

In a bog and in damp woods near Fort Fairfield we found two species of twayblade, one with greenish-yellow and the other with brownish-purple flowers. The "Lichen Garden on Mount Katahdin" were the hiding place of the spotted coralroot, named for the color of its root to the shape of coral. We also found its yellowish spotted relative.

It is a far cry from lowland orchids to the dwarfed and hardy alpine plants that survive the freezing winds and deep snows of Maine's isolated Mount Katahdin, which rears its

granite cliffs dramatically above the nearly level surrounding country.

Here live plants that were at first in their homes in the far North. I have learned to this day in the harsh environment to grow. They could not stand the summer heat and uncertain moisture supply of the lowlands, but on the mountain they have plentiful water supplied by fog and rain.

The top of Katahdin was so cold that June day that even with two pairs of gloves my hands were almost too chilled to work the camera.

Near the summit is a "cold-land garden" with a dense growth of very dwarfed plants edged with thick mats of *Deschampsia septentrionalis*, a small, thick-leaved heathlike plant with masses of small white flowers. Also found on other high mountains of New England, New York, and the alpine regions of Europe and Asia.

Near the edge of the Katahdin, near rocky cracks with a sunny exposure, we found *Pyrola asarifolia*, with pink-and-white, bell-shaped flowers and mountain heath, whose urnlike blooms are pink to purplish.



Here, too, we discovered the last remnants of the flowers of Lapland rosebay, which had reached its prime two weeks before. This dwarfed alpine herb, growing just the ground to avoid the cold wind bears eight-petalled flowers. It grows in Greenland and Labrador, but in the United States only the high mountain summits of New England and New York know it.

Along the trail further down grew a sub-alpine plant, Labrador tea, a low straggling shrub with clusters of white flowers and evergreen leaves, mostly covered underneath with low white woolly hairs. Indians in Canada have used it as a tea substitute.

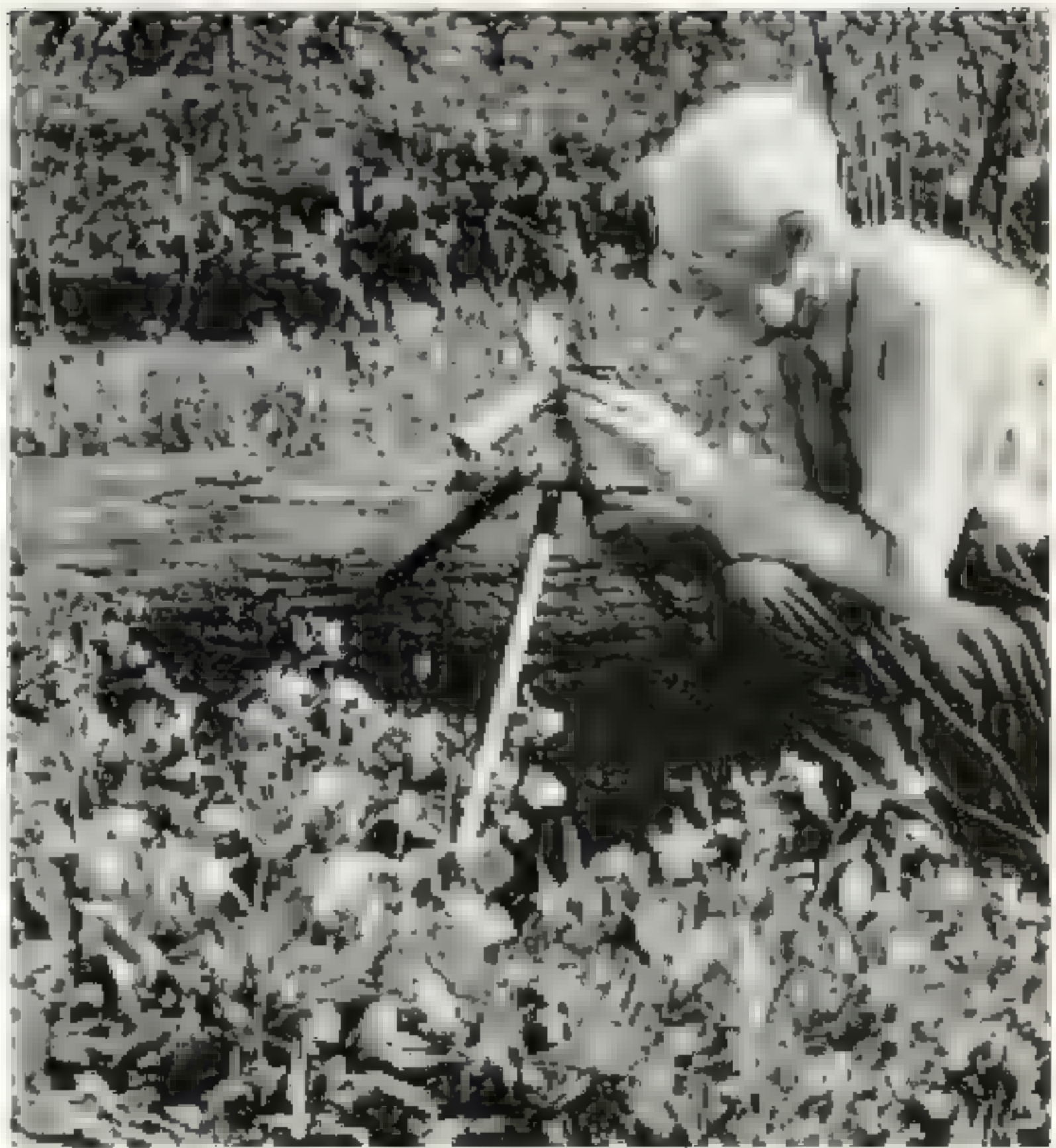
Here we found good stands of alder holly, a low shrub with crimson-pink flower and elliptical leaves olive green above and pale green beneath. I found it so deep it is sometimes called blackberry, but it does not recover.

Driving from Mooselook Lake to Moosehead Lake, we frequently saw the white form of the pink lady-slipper (page 602). Now and then a brood of young partridges scuttled into the underbrush while the mother sat in the middle of the road trying to block our car until the chicks were out of sight.

#### Hawkweeds Are Imported Pests

In open fields near Mooselook Lake were large areas of the beautiful but obnoxious orange and yellow hawkweed, two of the worst plant pests of New England. The weeds are believed to have entered the United States mixed with grain seed from Europe, before the days of plant inspection.

Our next major stops were the southern New Jersey Pine Barrens, an coastal bog around Hamptonton, long known as a botanists' paradise. We waded several hours through low water, which, although the earliest season flower were in the prime of their bloom. The plants are yellow, the color released when



Virginia Bluebell. Ornaments the Nation's Capital.

The author is kneeling in the bluebell field near the shore of Lake Umbagog in Rockport, Maine. The bluebells are in the foreground, and the water is in the background.

the plant turns a deep red color. The plant is a weed and swamp plant. The plant attracts carrion-eating flies which carry pollen from plant to plant.

Skunk-cabbage flowers are trumpet-shaped, yellow or purple. Almost all the close relatives of this plant are found in the state of Maryland.

Interspersed among the scrub oaks grow warm-rind, with its dense clusters of small pink-purple flowers, bearing a resemblance to its more yellow-spotted.

Patches of little heart-shaped plants, or flowering moss spread like snow on the sandy soil of a scrub forest near Hamptonton.

#### Potomac Valley Wears Lady's-slippers

In August, in the coastal bog near Lake Umbagog, one may find two yellow-flowered orchids, and in a cove on the shore the small, delicate white flowers of the pink lady-slipper.

Pink lady-slipper, or moosehorn flower greeted us in profusion in the Potomac Valley of Maryland and Virginia. This, our largest and most beautiful northern variety, is of



interest because of the way it forces honeybees to assist in its propagation.

Entering the flower, the bee enjoys a banquet of nectar spread for her, but when she is ready to leave she finds herself trapped. The only way of escape is through a narrow aperture where sharply pointed papillae comb out the pollen grains brought in by the bee on the hairs of her back or head. As the bee struggles on, anthers deposit fresh pollen upon her back, and this she eventually carries to the next flower, insuring reproduction of the species.

Pink lady's-slipper needs acid soil and will not live under ordinary garden conditions or if watered with chlorinated city water, which is too alkaline.

Trout lily (page 612) also blooms along the Potomac, in large yellow stands. Its name was bestowed by John Burroughs, the naturalist, who noted how the brown spots on its leaves resemble the fish's mottled coloring. The seeds develop a small bulb which produces only small leaves. Succeeding bulbs grow more deeply into the ground each year for seven years, producing flowers only at the end of that time. Then new seeds start the cycle again.

Many species of the wild flowers of this area may be seen in the 400-acre Conway Robinson Memorial Forest near Gainesville, Virginia.

Flower lovers of the Nation's Capital and near-by sections can enjoy a treat each year in the upper part of Rock Creek Park, where in April a large area is almost completely covered with trout lily, spring beauty, white rock saxifrage, and blue, white, and yellow violets (page 607). Many species of violets produce two forms of blossoms, one having the usual petals and the other the so-called "hidden" flowers near the roots.

Small colonies of trailing arbutus (page 610) also bloom in Rock Creek Park. Its fragrant white-pink flowers are harbingers of spring in many areas. The species is disappearing because it is hard to pick the blossoms without uprooting the plant. When it was found by the Pilgrims they called it May-flower, from its time of blooming.

#### Skyline Drive Offers Bright Display

Southwest from Washington the Skyline Drive and Blue Ridge Parkway offer one of the finest displays of wild flowers in the eastern United States (page 618).

Early settlers in the Appalachian region burned large areas to provide pasture, and this practice and subsequent grazing by cattle largely destroyed the great stands of wild flowers which grew here originally. They survived only around the edges of pastures and

in out-of-the-way places, but now that farmers have been moved from the park areas, wild flowers are making a strong comeback.

Here, without leaving the car, one may see pink azaleas, yellow lady's-slippers; viper's bugloss, introduced from Europe; wild pink; and bird's-foot violet. Many other species such as bog orchids and white buck bean, can be found only by searching bogs and adjoining fields and woodlands on a short hike from the road or the near-by Appalachian Trail.

Redbud and flowering dogwood are at their best between mid-April and mid-May along this route. The "flowers" of dogwood are not the true blossoms, but supposedly are intended only to attract insects to the small yellowish-green real flowers at the center of the showy bracts (page 606).

Trilliums (page 611), whose white flowers turn pink with age, also bloom at about this time in the same area. The flowers are very sensitive to light and turn on their stalks to follow the sun across the sky. The young plants of trillium sometimes are eaten as greens under the name of "mush-hunger," but the roots are highly emetic.

#### Cowslip Greens Are Edible

Big Meadows bog, between Panorama and Swift Run Gap, and other wet places along the road display quantities of yellow marsh marigold, or cowslip (page 613), also often eaten as greens. They should be boiled, not however, as the fresh leaves contain a poison.

Flame azaleas, ranging in color from pale yellow to deep orange red, and the rosebay, or rhododendron, bloom pink to purplish pink from the last of May to the middle of June or later, higher up in the Virginia and North Carolina mountains.

Red columbine displays its inverted, cornucopia-shaped flowers in the fields throughout the season, and around the end of July it will give for company the Turk's-cap lily (page 613), with its yellow-and-red flowers, and five-foot stalks of black cohosh, which has white spires rising one to two feet from a base two or three inches thick.

In the spring, dry slopes having acid soil display spring iris (page 612) with its big purple flowers resembling giant violets from a distance; and bird's-foot violet in two colors, the three lower petals lilac purple, the two upper petals dark violet.

No eastern State can surpass the wild-flower displays of North Carolina's coastal plain from spring to early fall. Driving from New Bern to Wilmington, four or five miles from

\*See "Skyline Trail from Maine to Georgia," by Andrew H. Brown, NATIONAL GEOGRAPHIC MAGAZINE, August, 1949.





100

100

Pink Lady's-slipper, Lowlies, Northern Orchid, Forces Bees to Assist Its Reproduction  
 The pink lady's-slipper is a beautiful flower, but it is not a very common one. It is a very rare flower, and it is very difficult to find. The pink lady's-slipper is a very beautiful flower, and it is very rare. The pink lady's-slipper is a very beautiful flower, and it is very rare. The pink lady's-slipper is a very beautiful flower, and it is very rare.









## A Pessantflower Reprobed Explores of Christ's Crown of Thorns

[illegible]

Light-sensitive Trillium  
Turns Blossoms Toward the Sun

[illegible]





★ **Spring Iris's Purple Blooms Spread a Vivid Scent**

Spring iris, and a few yellow ones. A few blue ones, but none of the blue color. From the lake, the water is very blue and the Spring iris, and a few yellow ones. A few blue ones, but none of the blue color. From the lake, the water is very blue and the

★ Trout Lily Takes Its Name  
from Mottled Leaves

The *Journal of the American Medical Association* has been the "front line" of the war against the tobacco industry. The *Journal* has been the first to publish the results of the landmark studies that have shown that smoking causes lung cancer and heart disease. The *Journal* has been the first to publish the results of the landmark studies that have shown that smoking causes lung cancer and heart disease. The *Journal* has been the first to publish the results of the landmark studies that have shown that smoking causes lung cancer and heart disease.

The first step in the process of developing a new product is to identify a market need. This is often done through market research, which involves gathering information about potential customers and their needs. Once a market need has been identified, the next step is to develop a concept for a product that meets that need. This is often done through brainstorming and prototyping. Once a concept has been developed, the next step is to create a business plan for the product. This plan should outline the costs of production, the pricing strategy, and the marketing strategy. Once a business plan has been created, the next step is to secure funding for the product. This can be done through a variety of methods, including crowdfunding, venture capital, and bank loans. Once funding has been secured, the next step is to begin production of the product. This is often done through a combination of in-house production and outsourcing to manufacturers. Finally, the product is launched into the market and sales are tracked to determine its success.

These two can be found as well as complete sets, North-South and East-West, and also the Northwest. The complete set is sold for a hundred dollars.







613

W. H. L. L. L. L.

# ▲ Marsh Marigold Spreads Golden Carpets in Swamps and Meadows

*Physalis perfoliata* L. (L. 1753) is a common plant in the low-lying areas of the marshes. The flowers are bright yellow and the leaves are green. The plant is a good source of food for the birds. Marsh Marigold grows from New England to South Carolina.

# ▼ Red Columbine's Inverted Blossoms Resemble Cornucopias

*Delphinium consolida* L. (L. 1753) is a common plant in the low-lying areas of the marshes. The flowers are bright red and the leaves are green. The plant is a good source of food for the birds. Red Columbine grows from New England to South Carolina.







Seaside Indian Paintbrush, or Painted Cup. Lives only on Rocky Cliffs Along California's Northern Coast.

Believed to occur at least 100 miles from the coast. In some parts of the range it is found on the rocks of the coast and grows to a height of 100 feet. Most of the plants are found in the range of the coast.









046

\* **Globe Mallow Brings Vivid Coloring  
to the West's Dry, Sandy Plains**

For thousands of years, the Globe Mallow has been a common sight on the dry, sandy plains of the West. Its bright, pinkish-orange flowers are a beautiful contrast to the dry, yellowish-brown soil. The plant is a hardy perennial that can survive in the harshest of conditions. It is a member of the Malvaceae family and is native to the western United States.

\* **Lewising Mountain's State Flower,  
Honors a Western Explorer**

The Lewising Mountain State Flower is a beautiful white flower with a yellow center. It is a member of the Malvaceae family and is native to the western United States. The plant is a hardy perennial that can survive in the harshest of conditions. It is a member of the Malvaceae family and is native to the western United States.





the ocean, we saw white Spanish bayonet occasionally growing in roadside fields.

Most interesting of the plants of this area is the Venus's-flytrap (page 629), a carnivorous plant found only in this region. It blooms about Memorial Day. The plant is difficult to keep alive in cultivation because it gets fewer insects than in the wild and because soil conditions usually are unfavorable.

Leaves at ground level around the base form the trap. When an insect alights or crawls upon a leaf, it touches one or more of three sensitive trigger hairs on each side of the leaf's midrib. This touch sends a stimulus to the midrib, causing the two halves of the leaf to close.

Stiff, hairlike bristles on the edges of the leaf interlock so that the victim cannot escape. Meanwhile the insect is covered with digestive juice excreted by the leaf when the trigger hairs are touched.

#### Sundew Fluid Fatal to Insects

Three species of another carnivorous type, the pitcher plants, also are common in this area. Two of them, one with red and the other with yellow flowers, bloom about Memorial Day, and a third, also having red flowers, about a week later.

Roadside ditches and low, damp areas nearby teemed with sundew (page 629) still another carnivorous plant. Its leaves are covered with sensitive reddish hairs which exude drops of sweet, sticky fluid. Insects attracted by the sweetness are trapped in it. As they struggle to escape, the hairs are stimulated to give off more fluid and bend over to trap the victims.

Other flowers that brighten the coastal North Carolina landscape include baptis, so named because of the shape of their flower stalks; white-topped sedge; violet, white, and yellow butterworts; and orange milkwort.

Along woodland borders we saw occasional loblolly-bay trees with large white flowers, resembling the famous "lost" Franklinia tree, named for Benjamin Franklin, which has not been found growing wild since 1790 and is believed to have been destroyed by fire and men seeking specimens for sale. Cultivated specimens still survive, however.

Shrubby honeysucs, with long racemes of large, white huckleberrylike flowers, are so common that they comprise 40 percent of the flora in the 48,000-acre Holly refuge near Hargett, North Carolina. Often we saw fields and roadsides covered with the spicy, fragrant white to purplish dwarf azalea. Yellow Jessamine, State flower of South Carolina, formed solid masses of color on trees and fences.

Solitary, erect scarlet flowers of the Catesby Fly, spotted with yellow, were conspicuous

though not common. Near the road we often spotted the two- to three-inch purple-and-flesh-colored passionflower (page 611). Its basal corona and fringe-like filaments are supposed to represent Christ's crown of thorns, and the nail-like pistils the nails driven into His hands and feet on the Cross. The five sepals and five petals supposedly are symbolic of the 10 faithful disciples, excluding Judas, who betrayed Him, and Peter, who denied Him.

In sandy fields we saw many beds of the blue common lupine (page 615), also known as sundial because its leaves rotate up to 90° to follow the sun. Often mixed with it was the beautiful rose-red *Phlox drummondii* introduced here from Texas.

One of the best flame-azalea displays may be found the last half of June on Mount Mitchell, in western North Carolina, the highest peak east of the Rockies.

Here also are large stands of galax, the leaves of which are much used by florists for wreaths and other decorations. It was here in a storm during a surveying trip in 1857, that Elsha Mitchell, the geologist and botanist for whom the mountain was named, fell into a stream and was drowned.

#### Rosebay Covers Roan Mountain's Top

The thrill of a lifetime awaited us at the end of June on the lonely summit of Roan Mountain, on the North Carolina-Tennessee border, reached by a dirt road from Bakersville, N. C. The higher of the mountain's two peaks has two large masses of rose-pink mountain rosebay, covering 400 to 600 acres, the most gorgeous display of wild flowers we saw in the entire Southeast. A fire tower on the lower peak provides a fine view of the blooms. Elsewhere this flower is rose purple.

Clingmans Dome, in the Great Smoky Mountains, with an automobile road nearly to the summit, offers one of the best views of the area. Pink rhododendron and white to pinkish mountain laurel, which bloom in this region in June and early July, can be seen on the peaks known as the Chimneys from the lower road, but near views of the most areas can be obtained only by a strenuous foot trip of several miles.\*

During World War II, when supplies of tobacco were in short supply, both rhododendron and laurel were used for making pipe bowls, and still are.

Mountain laurel is one of the most abundant plants all the way from the Berkshires of western Massachusetts to Florida. Some farmers consider it a weed and try to burn it out, but even forest fires do not kill it.

\* See "Pack Trip Through the Smokies," by Van Hart, *NORTH CAROLINA MAGAZINE*, October, 1972.









622

At Fort Huachuca, Arizona

### Bright-yellow flowers of Rabbit Brush Shimmer in the Mojave Desert

Rabbit brush loves plains and stream banks. It is a very common plant. Some species are found as far as the Colorado River. Once used as a crude cloth, it is now used for paper. The specimen of this type is from the Colorado River.

Hundreds of tons of its leaves are used annually as decorations, but even this practice does not threaten its existence.

Laurel stamens bend backward until the pollen ripens. Then, as part of the reproduction cycle, the stamens whip forward like resiliant whips, flinging pollen two or three feet onto neighboring flowers.

Flowers and shrubs are in full bloom early in March, and may be seen as far as 100 miles in each 100 miles of driving most of them just getting started. Among them are dwarf flag pawpaw, with one-and-a-half to two-inch white and yellow flowers, and small plants of yellow and blue and blue wild petunia.

Along the Tamiami Trail through the Everglades we found it worth while to drive slowly and stop often, though some flowers cannot

be seen without wading in the shallow water near the road. Most beautiful of southern plant pests, the bluish-purple water hyacinth fills the canal in many places on the north side of the highway (page 621). A constant eradication program must be maintained to prevent this foreign pest choking roads and rivers.

I had a very bad cold, and in the dark hours the symptoms were not far from fatal. Following a short rest, however, its nourishment from the atmosphere.

Also on the grassy bank is found the small flowered green larch. I succeeded in photographing the leaves of a very small specimen of larch by placing the leaf in a glass of water.

Along roadsides near Tampa we saw a small flowering milkweed with old white-veined leaves, a small purple sesban tree, and a low





### Black-eyed Susan Carpets a Field with Gold

Though native to the eastern part of the United States, the black-eyed Susan is now the State flower of Texas. This stand sprang up in Green Spring Valley near Radford.

purple cattle with three-quarter-inch fragrant white flowers, also called *fraxinifolia*, because it is so common in extremely porous to bare red yuccas.

A few miles west of Darden, north of Fort Worth, are occasional fields of yellow-headed goldenrod plant (page 287).

Close to the South we saw the two- to three-inch flowers of *repens* fly white with a purplish tint on the

### Louisiana Leads in Iris Species

Louisiana greeted us in April with its many species of iris, far more than can be found in any other State. A few may be seen at the Avery Island Bird Sanctuary south of New Orleans.

Unfortunately, many of the iris species have been lost forever through filling for levees and the draining of swamps. Countless thousands have been cut up for gardens, where in many cases they failed to survive.

Texas can boast that probably close to 40 percent of their wild flowers, except for introduced weeds, are found in no other State. The first such native, or endemic, species we saw was the famous State flower, the Texas bluebonnet, *Lupinus texensis*, which so closely resembles the more common *Lupinus termis*, also called bluebonnet that few people know the latter one.

An old legend says that the red spots on Texas bluebonnet petals represent blood spilled from an Aztec warrior's wound.

Approaching the San Antonio area we found most of the bluebonnets growing with Indian paintbrush, but about 60 miles to the northwest, near Kerrville, was a solid field of bluebonnets covering several acres (page 634).

Along the road from Boerne to Mountain Home were many pink mimosa, yellow wild flax, a low white-flow-

ered yuccalike plant called bunch grass, or sacchariste, and white robin lily, which lies dormant until a rain and then comes up thickly.

In east Texas we also saw several flowers common throughout southeastern and northern plains areas, including false dandelion, false hagenberg, and white cups with one- to two-inch red purple blossoms.

On the high, arid plains of west Texas vegetation is markedly different, but even in dry years mesquite, creosote bush (named for its odor), sotol, and several species of cactus bring forth their flowers. Other plants lie dormant until, every three to seven years, there is sufficient rainfall; then the plains flame with color.

Two common flowers we saw were Indian blanket, or fire wheel, with a wide red inner ring and a narrow outer ring of yellow, and the tall pink gold-eye phlox (page 632).

The Texas Highway Department at Austin



furnishes advance information about the prospects of a new flowering season and carries on an extensive roadside planting program. On the approaches to bridges and culverts several large species of Spanish bayonet have been set out. One of these, *Yucca treculeana*, is often ten to twelve feet tall and displays clusters of large white flowers from three to five feet long and two or three feet in diameter.

We had the good luck to find in the Davis Mountains the only native American species of yellow-flowered waxwood, *Hamamelis virginica*, which is found in only a few localities there.

#### Mexicans Make Cactus Salad

Beyond, on the plains, were yellow flowers, much like the livestock and so abundant that it largely destroys the value of other plants for grazing.

Many of these are very prickly, but one of the most common is prickly pear (page 630), from which the Mexicans make a salad and candy after removing the spines. One of the varieties, known in Mexico as tuna, has an edible fruit. Another variety is best eaten when ripe.

Most prickly pears have large yellow flowers, some of which often take on bright lines with age. The joints have many long and small barbed spines.

Cereus cactus, barrel cactus, have vertical jointed branches several feet high; the flowers are small, pink, rose, or red (page 630). In some species, known as chichas, the joints are so loosely attached that they drop off at a mere touch, as I learned when one of the barbed spines stuck in my back while I was taking a picture of a specimen.

Barrel cacti are low, cylindrical, single-jointed plants, sometimes forming spiny hemispherical mounds. The flowers are



Water Hyacinth, a lovely pest, hinders boating in Florida.

This is a very common plant in Florida, and it is a very beautiful one. It is a very common plant in Florida, and it is a very beautiful one.

muscle length, and, moreover, it is a very beautiful one. It is a very common plant in Florida, and it is a very beautiful one.

Barrel cactus flowers, which are to the foot long but larger than still smaller or barrel cactus. The plant itself is somewhat coarsely branched and has clusters of small, long, tubular flowers that vary from yellow to red. Texas desert travelers sometimes cut off the top of the 'barrel' and drink the juice secreted in the white pulp.

Another cactus (page 631) is a barrel cactus, named for its small, uplike shape. It is in general low in height, and the presence of Nature prevents excessive loss of moisture by transpiration in the desert.

As we approached the Chisos Mountains which rise with unexpected rugged grandeur in the southern part of Big Bend National Park, the first change from the desert flora that we noticed was Texas madroño, a small tree member of the heath family with thick





# Snow-white Maltese Puppies Beauty Southern California Coast

These puppies are the result of a careful selection of the best blood of the breed and are the most beautiful and healthy of the breed.





1971

Barry Scheraga

## Giant Cactus Rears Contorted Arms Aloft, Jumping Cactus Seeks to Throw Its Spines

Most of the plants in the desert are small and unassuming, but some are not. The giant cactus, which can reach 100 feet in height, is one of the most impressive plants in the desert. It is a member of the cactus family, but it is not a true cactus. It is a member of the family of plants known as the "jumping cactus" family. The jumping cactus is a member of the family of plants known as the "jumping cactus" family. The jumping cactus is a member of the family of plants known as the "jumping cactus" family.

glossy, rim-like leaves and dense clusters of white buckberrylike flowers.

At a pass leading into the Chisos Mountains basin stood a huge rock some 500 feet high and 100 feet wide. It was a natural altar to the gods of the desert, a place where the people of the desert would come to worship.

### Century's Spikes Used as Weapons

Century plants are so named because they are slow to mature and blossom, although most species bloom in about 20 or 30 years. In the desert, the century plants are often found in the same places where the people of the desert would come to worship. The people of the desert would come to worship at the base of the century plants, where the people of the desert would come to worship.

Mothers make pulque, which is made from the fermented juice of century plants and distill the molasses to produce potent tequila.

Long stretches of the coastline toward El Estero were covered with the spines of the branching type of century plant. In another section of the coast was a solid wall of century plant. The spines of the century plant were used as weapons by the people of the desert. The people of the desert would come to worship at the base of the century plants, where the people of the desert would come to worship.

After several hundred miles of desert driving we had a longing for green vegetation and satisfied it with a trip up 10,713-foot Mount Graham, in Arizona, where snow still remained near the top. Water from the melting snow had brought to life small white plants in a mountain marshland.

A small species of yellow-flowered white flowers was not used for Christmas decorations, but it was one of the plants of the



man's spruce. Like its eastern relative, this mistletoe has rootlets which penetrate the bark and absorb sap but apparently do little harm to the tree.

A violet haze covering the ground near Globe, Arizona, proved to be a large growth of very small pillia, suitable for cultivation in rock gardens. Farther along the roadside the leguminous paloverde tree, which bears its seeds in pods, was a solid mass of golden flowers. During the dry season these trees are leafless, but they remain conspicuous because of their yellowish green bark.

Wild-flower lovers visiting this area should not miss the Boyce Thompson Southwest Arboretum near Superior, Arizona, where several hundred plants native to this region are brought together. Here grows yellow-flowered incienso, which yields a gum formerly chewed by the Indians and used as an incense in churches.

Tall, whiplike, thorny stems of the acacia, ends closely covered with bright-red flowers, were often seen on rugged slopes and roadsides beyond the arboretum. Its leaves fall off in dry weather but grow out again after a rain.

#### Tall Saguaro Useful to Birds

Farther down the slopes were many giant saguaros, which produce the State flower of Arizona and often reach a height of 50 feet. The upper half of this cactus has several erect arms, crowned by conspicuous white rings of flowers. Woodpeckers drill holes in the saguaro for nests, which later are taken over by old owls. Birds feed on the pulp.\*

Two-inch wide white flowers of Easter daisy, which bloom only at Eastertide, greeted us at Grand Canyon National Park. On the Dripping Spring Trail in the canyon itself we saw a low pink phlox, often grown in rock gardens; red-bracted Indian paintbrush and a red-flowered leardtongue.

As we crossed from Arizona into Utah, the next morning we saw white-flowered desert lilac, a shrub with pinkish gray and yellow Oregon grape. There is also Oregon state flower, and its blue buds form small clusters.

Sparse desert vegetation through Utah and Nevada was punctuated by gray sagebrush and 15- to 30-foot Joshua trees, the only yucca which has many short branches.

California greeted us with desert willow, not really a willow at all, for it thrives on little moisture and for this reason is much used for windbreaks in the Dust Bowl area farther east. Sand verbena, another desert flower, displayed rose-purple blooms.

Along the edge of the Mojave Desert, at Victorville, California, we found in an oasis, formed by runoff from irrigation water, a

large stand of one- to two-foot yerba mansa with small white flowers on a conical spike, surrounded by five to eight white leafy bracts.

Cajon Pass, 3,823 feet high, brought us the finest display of wild flowers we had seen west of Texas. Most striking were the many quixote plants, more aptly called candles-of-out-land, for the stalks stand up exactly like candles in a candelabrum.

#### Santa Barbara Garden Covers State

Santa Barbara's fine Botanic Garden provided in two days a better view of California wild flowers than could be obtained in weeks of travel. The plants are set out in typical habitats, such as arroyo, canyon, chaparral, desert, foothill, forest, island, meadow, and woodland. Here we saw yellow bladderpod, yellow giant coreopsis; white Apache plume, so named because its seeds bear tiny plumes that enable them to sail on the wind; white matilja poppy (page 622); yellow bush poppy, and yellow Fremontia, or drumstickbush, named for the famous explorer of the West, John C. Fremont, who discovered it in 1846.

We also saw gum plant, whose fluid extract is good for poison ivy, but, strangely enough, often works only once for any individual.

The State flower, California poppy, once was plentiful in coastal valleys and foothills. Accounts of sailors and others who visited the San Francisco Bay area in the days before California was settled tell that the hills around the bay were solid with California poppy. Spaniards called it *copa de oro*, or "cup of gold." Now it is seldom found abundantly except in inaccessible spots.

Some of the country around Bakersfield only a few years ago also had beautiful displays of wild flowers. Since then, however, 5,000 acres have been plowed for planting grain.

Crossing 2,224-foot San Marcos Pass beyond Santa Barbara, we were rewarded by finding crimson sage; chaparral, a name applied to thickets of rigid or thorny shrubs on dry mountain slopes; chamise, with close panicles of small white flowers; and red heart, so called because the upper sides of the branches become reddish brown in drying.

Sheets of gorgeous color greeted us along the coastal highway that parallels the Pacific. Lower slopes of the Coast Ranges were covered with solid masses of blue and white lupine. Toward Lucia the blue lupine is replaced by yellow in a similar display (page 626).

Beyond Carmel were brilliant orange-red displays of seaside Indian paintbrush, or painted cup (page 614), and one of the

\*See "Saguaro, Cactus Camel of Arizona," by Forrest Shreve, National Geographic Magazine, December, 1945.





### Insect-consuming Pitcher Plant Drowns Its Prey in Rain Water

At left, the pitcher plant is shown in its natural habitat. At right, the pitcher plant is shown in its natural habitat. Pitcher Plant can also be seen in the garden at the University of Maryland.





187

Japanese Camp at the Pacific Shore with Golden Gate Bridge, San Francisco, California

View of the Japanese Camp at the Pacific Shore with Golden Gate Bridge, San Francisco, California. The camp is situated on a hillside overlooking the city and the bay. The bridge is visible in the distance.



# Western Gentian's Flowers Hug the Ground

Gentians of the Western Continent of flowers hug the ground and their only petal is a blue

The



# Checkerboard Calhoun's Hedges

From a seed box containing the seeds of the checkerboard, the checkerboard.

127







Carnivorous Flooded Flower Plants, Paved the Cactus, Awaits Their Prey Near Lake Puma, Florida

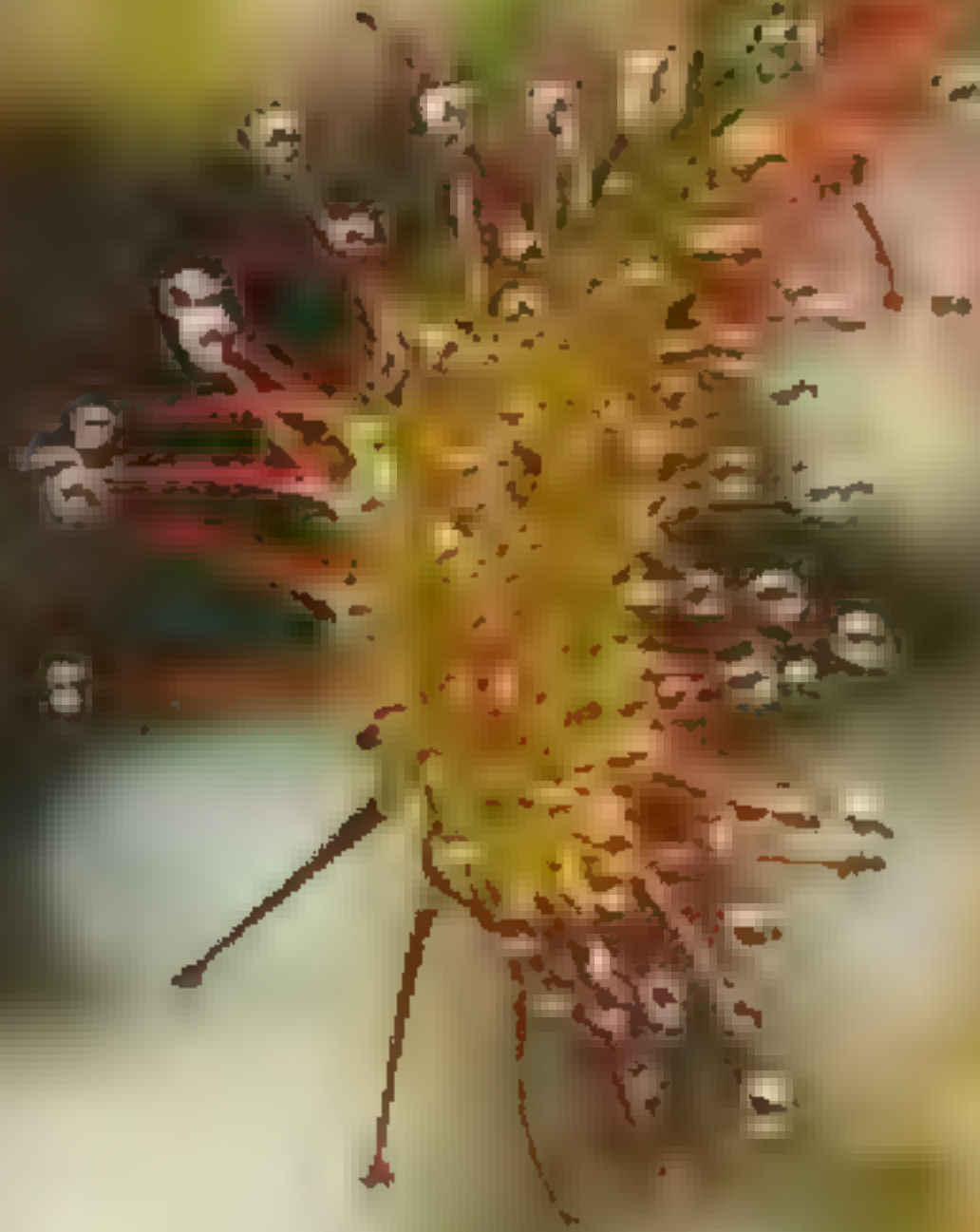
Several of the most interesting and most beautiful of the plants of the Florida Everglades are the carnivorous plants, which are found in the flooded areas near Lake Puma. These plants are of the genus *Sagittaria*, and are known as *Sagittaria arifolia*. They are found in the flooded areas near Lake Puma, and are known as *Sagittaria arifolia*. They are found in the flooded areas near Lake Puma, and are known as *Sagittaria arifolia*.



# Venus's Flytrap (Right) and Sundew Set Efficient Snare to Catch Insect Food

Fished with and baited the Venus's Flytrap on pond and forested up a waiting pool. It can be used to catch insects and other small animals in the water. The Venus's Flytrap is a very efficient snare to catch insect food. This plant grows from the edge of the pond.

4. Some of the Venus's Flytraps are like dew drops. They are called the "Sundew" and are used to catch insects. An insect that touches the Sundew's sticky leaves will be caught. The Sundew's leaves are very sticky and will catch insects. An insect that touches the Sundew's leaves will be caught.







#### • Cane Cactus Guards Flowers with Sharp Barbs

Long spines guard the flowers of the cane cactus in a place that is warm and sunny. The spines are sharp and the flowers are red. The cane cactus is the same cactus in some parts of the desert. This is the same as the cane cactus in some parts of the desert. The cane cactus is the same cactus in some parts of the desert. The cane cactus is the same cactus in some parts of the desert.

#### • Yellowish Nipple Cactus Is a Prickly Dwarf

The yellowish nipple cactus is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert.

The prickly pear cactus is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert. It is a small and prickly cactus in the desert.

Copyright © 1999 by P. L. Lerner  
All rights reserved.











NO. 1—TIDY-TIPS

632

NO. 2—GOLD-EYE PHLOX

**A Tidy-Tips Are Nearly Ringed  
with Irradiate White Edges**

Tidy-tips are America's favorite flower, and are found in every part of the country. They are in the variety known as the "tidy-tips" and are the only flower which is not a daisy. They are found in the hills and mountains.

**Y Gold-eye Phlox Is Found  
Only in Texas' High Prairies**

Gold-eye phlox is one of the most beautiful and rarest flowers in the Lone Star State. It is found only in the high prairies of the state. It is a very rare flower, and is found only in the high prairies.





beard-tongues. There are more than 250 species of this attractive plant, the beard-tongue, all native to North America except for a single Japanese species.

A strange example of Nature's adaptability can be seen at Point Lobos State Park. Here is the country's last sizable stand of Monterey cypress. Growing on its branches are long streams of a green alga supposed to have been blown there from the sea several hundred thousand years ago and to have adapted itself to growing out of water. It is festooned like Spanish moss and now draws nourishment from air instead of water.

#### Rich Display at Point Lobos

The flower display at Point Lobos excelled in color anything else we saw in our odyssey. Included in it were a lavender mallow called checkerbloom (page 627), a rose-pink gentian called anchalagua, purple owl's clover, a yellow composite known as lizard's-tail, and sulphur-yellow tidytips (opposite), all mingled with seaside Indian paintbrush. California has more than 1,000 species of wild flowers not found in any other State.\*

Yosemite National Park displayed large bushes of white western azalea and yellow pond lily. In the garden near the park museum were Silver's lupine, with yellow banner and pink wings; wild geranium; and white to pinkish pussy's-paws, whose flowers suggest the feet of a cat.

Western flowering dogwood grew along the drive to Glacier Point, with five white bracts instead of the four of the eastern species. Higher up, a mountain meadow was covered with small white coast marsh marigold, while in the background was a stand of white fir, its trunks covered solely with a small branching yellow lichen which was once used by the Indians for dyeing clothing and blankets.

Along the road in pine woods we saw the bright-red snow plant, a relative of the Indian pipe, which sometimes grows near the edge of melting snow and is saprophytic—that is, it feeds on decaying vegetation. It first appears above ground as a large inverted cup-shaped bud and gradually develops a thick, scaly red stem up to 15 inches high, the upper half bearing fleshy red flowers.

A wild flower nursery above Columbia displayed thousands of trout lilies raised from bulbs which mature in two years instead of the seven required by the eastern species.

Near Myers the ground was covered with an attractive small white flower called western centaur (page 627). Its small blossoms and habit of growing close to the ground make it appear much like the eastern trailing arbutus. Farther on, near Lake Tahoe, were many camas lilies with racemes of small

dark-blue flowers. Just north of Ukiah we saw many summer's darlings with one- to two-inch rose-pink flowers and a central blotch of a deeper shade on each petal.

Pinecracker plant, well named for its cluster of tubular bright-red flowers about an inch long, was seen at Richardson Grove on the scenic Redwood Highway.

Covering the landscape at Little River State Park was yellow lupine. On the sandy approaches to the beach were large areas of a trailing yellow sand verbena.

Large stands of pink coastal rosehay, or rhododendron, State flower of Washington, were blooming at Del Norte Coast Redwoods State Park, and near by grew a rose-red corn, or bead, lily. Near the coast at Smith River, we saw the western species of the phacelia, and baby blue-eyes.

#### Azaleas Blaze in Oregon Park

Azalea State Park, just across the California line in Oregon, has a fine display of white to creamy western azalea and occasional bushes of honeysuckle bearing small black fruits surrounded by conspicuous red bracts.

A few miles west of Cave Junction, Oregon, we were guided to a mountain bog filled with western pitcher plants, with one- to two-foot slender hooded pitchers and one-and-a-half- to two-inch pendulous dark-purple narrow petals.

Topping a 2,600-foot ridge to catch our first view of snow-capped Mount Hood, we saw three- to four-foot stalks of bear, or squaw, grass, bearing conical racemes of small white flowers six to twelve inches long. In a boggy area at the base of Mount Hood were growing many plants of western skunk cabbage, which has two- to three-inch bright-yellow spathes enclosing the inner fleshy body that bears small flowers.

Several feet of snow were still banked behind Timberline Lodge, 6,000 feet up on the slopes of Mount Hood. Below it the banks of a small stream fed by the melting snow were covered with coast marsh marigold, white coast trillium, and a purple shooting star (page 615).

Near Olympia, Washington, at Hawks Prairie, we found lupine, bellflower, Oregon sunshine—a composite with yellow flowers—and two-foot stalks of death camas, so named because its roots contain a deadly poison.

Near Vantage, Washington, where we crossed the Columbia River, we saw blazing star, with its two- to three-inch yellow flowers, and sulphur flower.

\* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "California Says It with Wild Flowers," by Francis Woodworth, April, 1942; and "Wild Flowers of the West" by Edith S. Clements, May, 1943.





### Schwartz's Effect on a Sea of Bluebonnets: the Texas State Flower

In W. C. Texas roadside and prairie turn a gorgeous purple with stands of the state flower. Many of Sunday motorists drive out to see them. Artists have devoted their careers to painting them.

Flowers of Yellowstone National Park are a marvel and a well-remembered. I will mention a few more: a purple, yellow, and white. I will mention a few more: a purple, yellow, and white. I will mention a few more: a purple, yellow, and white.

The drive eastward from Yellowstone Park to Bozeman Lake and over the 10,000-foot Bozeman Pass to Bozeman Lake, Montana, not only offers one of the grandest scenic areas of the Northwest but offers a fine variety of wild flowers. They include: Larkspur; anemone, whose European relative provides the extract used in the medicine of the same name; and, at the top of the pass, Mariposa lily and orange marigold, the last often called the "mountain" flower.

The most common flower, the state flower of Montana, grows in this region. Its genus name honors Meriwether Lewis of the Lewis and Clark Expedition. Buttercup is found from Montana's Buttercup Range, named for it, westward and south to Arizona. The Indians once roasted the starchy taproot for food.

So at and from Yellowstone Park few wild flowers appear on the arid plains, but occa-

sionally we get a glimpse of a purple, yellow, and white. I will mention a few more: a purple, yellow, and white. I will mention a few more: a purple, yellow, and white.

Finest of Wyoming wild flowers I saw were in the high meadows of the Medicine Bow Mountains west of Laramie. Here and there, amidst the tall grass, were a wonderful subalpine garden with hundreds of Rocky Mountain yellow marigolds and crimson-purple primrose. Nearly were white sandwort, purplish, and, rose-purple heads of alpine clover, or-bristled Indian paintbrush, trout lily, and fleabane, blackberry, and bog laurel.

Crossing 11,797-foot Laramie Pass, northwest of Denver, we photographed large areas of yellow alpine sunflower. In a small basin, a small basin with terminal clusters of both long-way white flowers.

Wild flowers furnish beauty everywhere. Some of the loveliest grow in harsh deserts or on the chill summits of barren mountains. Whenever seen, they reaffirm the glory and wonder of Nature unspoiled.

For other articles on wild flowers of the United States, see the *United States National Geographic Magazine Cumulative Index, 1909-1952*.



# The GI and the Kids of Korea

83

American Fighting Men Share Their Food, Clothing, and Shelter  
with Children of a War-torn Land

By ROBERT H. MOSIER

*Technical Sergeant, United States Marine Corps*

I SLEPT pretty soundly when I was awakened at a battalion command post; they're usually a good 1,000 yards back of the front line. But when the machine-gun slugs began whining over our tent, I woke up.

From the tinny cough of the gun I figured it was a light Russian type, like a Browning. From the angle of the shots I decided the North Koreans who had lugged it through our lines must have set it up near our mortars and were shooting across our gulch, the bullets ricocheting off the boulders at our back. With no moon to see by, they were just spraying the neighborhood in general.

Our riflemen up on the hill opened up about then, and a fairly brisk fire fight got under way. I rolled over, shaved my head under my sleeping bag, and tried to go back to sleep. There were a lot of green replacements in the area that week, and anybody who got up and wandered about after dark was as likely to get clipped by our side as by the enemy.

But after a while, in spite of all the racket outside, I could hear somebody shuffling around in our tent. I thought it might be Sgt. Roy Duncan, the new photographer just assigned to the 3d Battalion, 1st Marine Division, so I said:

Listen, don't get all shook up. This sort of thing goes on all the time."

He didn't answer, though. In a moment a match scratched, and I saw by the candle he was holding that it was Kim, my houseboy. His pack was at his feet, and he'd been lugging it with all his most precious possessions—his album of pin-ups, a tattered old Christmas card from my wife, a carton of cigarettes, and stuff like that.

## Too Much for a 15-year-old

"Where do you think you're taking off for?" I asked him.

He looked at me, and his lip was trembling a little. "Movie," he said. "They show movie back at photo lab."

I glanced at my watch. "Looks like you've missed the beginning of it already," I said. "It's 2 a.m."

I'll say this for Kim: It was the one and only time I ever saw him scared. He was 15 years old; this was the second winter of the war, and he'd taken plenty. I used to get a lock watching him walk around under counter-

battery fire, as cool as a field ration, while recruits from stateside were diving for the ditches.

I first met Kim at a refugee camp near Changdo-ri. It was snowing, and I was standing by a sentry fire talking with some of the men. Kim came out of a tent near by. He stood there quietly until there was a lull in the conversation, and then he put a question through one of the Korean guards: "Could I be your houseboy?"

It was pitch dark, but in the light of the lantern I was surprised to see the kid was neat as a pin. Even his shoes were shined. It had been so long since I'd seen any youngster who wasn't dirty, ragged, and generally beat-up that it gave me a jolt.

## Kim Finds a Barber

I checked into Kim's record. He came from a Korean Christian family that lived in Hong-chon. His father had been killed and his home bombed out, and he had wandered up toward the front in search of work or food or both. He'd been pushed around a good deal, but he wore a grin that looked as if it were stuck on to stay (page 619).

I accepted Kim. Or perhaps it was the other way around. At any rate, we took care of each other. I gave him tent space and part of my rations and whatever odd bits of clothing and gear I could scrounge. In return, he policed our quarters, washed my clothes, and guarded my belongings when I was out on jobs as a photographer assigned to division headquarters. Occasionally he cooked me Korean dishes.

Kim spoke no English at first, and I no Korean; but we learned fast. He carried a pad with him everywhere, pulled me up short on any word he didn't recognize, and made me write it down. He didn't have to be told anything twice.

American food didn't sit too well with Kim for a while. In a few weeks, however, he developed a passion for what he called "No-1 chow"—spaghetti, ice cream by the quart, steak, and candy from my rations.

His liking for American things went further. He plastered his part of the tent with color pictures cut from American magazines. He talked my arm off about American trade schools, never quite getting over his surprise at the idea of youngsters being trained free.





630

U.S. MARINE AND KOREAN ORPHAN

# Gifts and Gilt Span the Language Barrier Between U. S. Marine and Korean Orphan

MANILA, P. I. (AP) — A U. S. Marine and a young Korean orphan, separated by a language barrier, found a way to communicate through the exchange of gifts. The Marine, who is stationed at the U. S. Marine Corps Recruit Training Center in P. I., has been giving the orphan, who is about 10 years old, a variety of gifts, including a doll, a book, and a small animal. The orphan, who is named Kim, has been giving the Marine a variety of gifts, including a small animal, a book, and a doll. The exchange of gifts has helped to build a bond between the two, and has also helped to break down the language barrier between them.





### Abducted from the Fighting Zone, These Anxious Orphans Expected Marines to Eat Them

When Marine Captain Clegg learned that a group of Japanese war orphans had been abandoned in the fighting zone, he decided to take them to the rear. The orphans were in a state of extreme anxiety, expecting to be eaten by the Marines. Captain Clegg decided to take them to the rear and care for them.

He had to be pulled bodily out of a hot shower. He saw every man that came to our area and was sure to tell them that all Americans either took them as slaves or killed them, but he was as a matter of course, and whispered that other with strangers in the street.

It was inevitable, I guess, considering the job, that Kim wasn't the only one who was "freaked." I got him a small camera, advised some slightly longer movie film and took him to see the cartridges in our big sleeping bag. He was so excited he would rush to the tent door, shoot 16 exposures in 16 seconds, and return for more.

#### To Hongcheon for Christmas

When he came down and learned something more about the situation and lighting the deal went well. In fact, he even went out and tried to get some pictures of the orphans. He was so excited he would rush to the tent door, shoot 16 exposures in 16 seconds, and return for more.

Kim wasn't particularly homesick, but as the Christmas season rolled around he began to get itchy feet. So I decided to surprise his family and take him back to Hongcheon for the holidays.

This meant presents, of course. Not electric trains or neckties or perfumes as you get them in the States, but things that don't have department stores along the coast. It meant a few boxes of soap, the quartermaster section, where Marines going home or others wanted their personal things. It meant getting some fruit out of a set of long boxes and a army pack. It meant saving up my PX ration of chewing gum and chocolate.

Finally, though, we had our sleeping bag loaded with food, I got a pass, and we started him on his way south to his home. A Marine got him some money for his journey. Then we loaded an Army supply truck heading for the engine dump.

Now was coming down as usual and had the church life was in the air, but





The Kid Who Walks Alone: War's Little Old Man Ascents the Rangoon to a Rescue Plane

With this in mind, we designed a series of exercises for the future. Since the future is beyond our reach, we can place the responsibility upon "you" and hope this plan does something for you. It is a plan for the next 100 years, but it is not meant to be taken too literally. It is only a guide to help you think about the future and to make it a better one.



the crumpled mountains looked as serene as ever. I heard Kim muttering something, and, when I asked him to translate, he quoted another line that went about like this:

After the close of my house I count  
of my mountain home.

The long road thither is the road of  
my desire.

When at dusk their voices call my  
name.

And love flows down to me from  
those far heights.

For most of the five-hour trip through the hills and battered villages, Kim concentrated on the harmonica my wife had sent him for Christmas. He was trying to play the Marine Corps song. He made a hash of it, but he kept trying.

It was dark when we pulled into the courtyard of Kim's home. After the family's house in Hongcheon proper had been demolished, they had moved into a farm building 14 miles northeast of the city. I could spot the dull gleam of a catalla; otherwise the place looked dead.

It came to life with a bang when Kim swung open the door and yelled that we were here. More people boiled out of the house than I had thought were in the whole village.

While his sister and the servants danced around him, and everyone at the table, Kim's mother took his face in her hands and stared at him as if she wanted to memorize every line in it. She hadn't seen him for six months, and I guess she had wondered whether she ever would again.

I was reminded of Kim's servant, a poor fellow who crossed between Samsung and Amsong Limoda. At any rate, my old friend began playing a wailing tune, and I stood there feeling like a freak and wondering if I should bow back at them. But Kim's grand mother would not have a thing more say; he was a man and shook hands.

#### A Party To Be Remembered

That broke the ice a bit. Kim's good-looking sister plucked some green plumed mushrooms. His grandmother cleared a place for us on the rice mat, and a servant rushed off for a hot drink and some food (page 657).

It was just an evening. If they thought we were both too good when we first arrived empty-handed, they were ready to treat us mayor and president respectively when we lay in our sleeping bags and unloaded our presents.

I've never been backstage at a musical comedy on Christmas Eve, but this was a bit



634

THE NEW YORK TIMES

#### Kim, the Author's Friend, Wears an Idolized Crim

Infatuated with all things American, Kim could not resist a steak, cowboy movies, pin-ups, hot showers, and photography. Able to eat like fellow Koreans and natural photographer, he has taken snapshots superior to Marines' official photos. Here he practices with Sergeant Mosier's old camera (page 668).

the way I required it would be everyone smoking. Lightly peeling old and cast-iron and even a rubber, paraffin and little ones, some singing stations, it's only a general lifting the lid.

The 30 on the clothes line, packed around five and six tailor-made, pressed with his own shirt. Kim's sister told me a Marine kangaroo jacket with USMC on the left pocket. I came down to the knees. His grandfather, whitebearded and dignified in his old age, had a little and a little fatigue cap he seeted. But nobody could.

As the party picked up speed, more and more villagers kept trickling in. The kids romped through the sort of rummage sale we had set in motion. The old gentlemen squatted on the wall, puffing on their little bamboo-stemmed pipes. Since few of the Marines I knew smoked pipes, I had been able to get hold of a good many tins of tobacco from the PX, and now I doled them out.

When all the clothes had been pawed



through, we produced American magazines. In two minutes the grownups were playing cut-it-out-and-paste-it-up. The men went for the pictures of chromium-covered cars, complicated farm machinery, and bathing beauties. The women gawked at the automatic electronic gadgets in the spotless, fancy kitchens.

Both men and women were bowled over by photographs in color of Iowa cornfields and plains of Montana wheat. Korea is so hilly that if you set a marble down anywhere in it, I don't think it would stop rolling till it plunked into the sea. The sight of those vast flat spaces in America was, in a way, more impressive to Kim's folks than any shows I could have shown them of factories or cities or stacks of dollar bills.

A picture that especially appealed to the women showed an American man wheeling a baby carriage with one hand and carrying with the other a big bag of groceries, while his wife pranced along beside him holding nothing heavier than her purse. The female chatter over this revolutionary scene came to a dead stop when Kim's grandfather (the big boss, as in any Korean household) strode over and asked what all the fuss was about. The women turned the page, quickly.

The party broke up about midnight. Neighbors and family members drifted away until only Kim and I were left to occupy the living room. We stretched out our sleeping bags and turned in, our heads pillowed on rice bags.

#### Sleeping on Stove-heated Beds

The stone floor slabs, heated from beneath by the exhaust from the sunken cookstove, had been so hot earlier in the evening that I had had to requisition a cushion to insulate the seat of my pants. Now they had cooled to a pleasant warmth.

As I dropped off to sleep I could hear some of the village kids still singing. The words were Korean, but I recognized the tune. It was "Silent Night."

When I woke around 8:30, I found my dungarees had been not only washed but starched and pressed to a knife-edge. What's more, Kim's mother, noticing that my trouser cuffs draped over my boots and picked up the mud, had inserted elastic bands to make them fit snugly and dry.

Kim's sister brought us a pan of hot water, and, after we had washed, a bowl of rice. My first efforts with chopsticks landed a big wad of rice in the lap of the grandmother. She told me it was the silliest thing she could remember and she was too old to forget and ask me how. Once and for all under the little low table they dined from.

I had trouble with another Korean custom, too. It was easy enough for Kim's folks to

slip off their soft shoes when they entered the house. It was another thing for me to unlace my big boots every time I came in and to lace them up when I left, particularly when the grownups kept calling me inside to talk and the kids yelled to me to come out and play.

They gave me a good time, though. I felt almost as choked up as Kim when we had to say good-by and hitch our way back to the front lines. Kim's grandfather made a little speech about how grateful they were, and all that. I'm not going to repeat it, but I haven't forgotten it; it was the kind of thing you wouldn't mind having for an epitaph, if you have to have an epitaph.

I thought about that matter of gratitude as we rode north. The Koreans I'd met had been really surprised at the kindness our troops showed toward their kids. Not that they don't like their own children, but their sympathy tends to dwindle at the limit of the family circle.

#### Reds Starved Hungry Children

Moreover, they said they'd seen the Chinese Red soldiers either ignore or shy rocks at youngsters who tried to beg food from their company messes, and they expected our men would act the same way.

My work as a photographer had taken me around a good section of the forward areas, with Marine infantry regiments, tank and weapons companies, and rocket teams, Korean Marine units, and Navy medical sections. I'd seen what the Marines had done for Korea's kids, and I'd heard or read about the work of the other services. I guess they weren't doing anything that GIs haven't done in any country they've fought in; but, all the same, it made me feel pretty good to be an American.

A lieutenant with the 11th Marines—Harry L. Gary—took one look at the grease-pimpled, ragged kids around his base and wrote home to Springfield, Missouri. Inside of 12 days his aunt and uncle and the local newspaper had put on a clothing drive and begun shipment of about three-quarters of a ton of socks, shoes, gloves, and things like that.

At Camp with the 1st Marine Aircraft Wing, M'Sgt. John Cain, began to chip in part of his pay to send some Korean kids to school. When Cain was shot down over North Korea the rest of his squadron took over the job. Now they have 20 kids in school and are trying to build a new one to house 100 more.

The wing as a whole didn't do so badly, either. By the time I left Korea, it had collected more than 100,000 pounds of clothing from home and had passed it along to some 2,000 orphans and hundreds of refugees (page





AP/WIDE WORLD

61

AP/WIDE WORLD

### An Elderly Carrier Paces Korea's Future with Faith and a Strong Back

Some of the nation's heaviest work is still done by man power. This picture shows an elderly carrier who has spent his life carrying a heavy load on his back. He is one of the few left in a country where most of the work is done by machines.





602

Went to Stearns River, which I returned to many Korean farmers, but no houses, I met with the Japanese people.

The road where the 30th Regiment was sent to the Japanese people, but no houses, I met with the Japanese people.











Chadler (Pen Pals  
and Image Post  
with Carol Keating

[illegible]

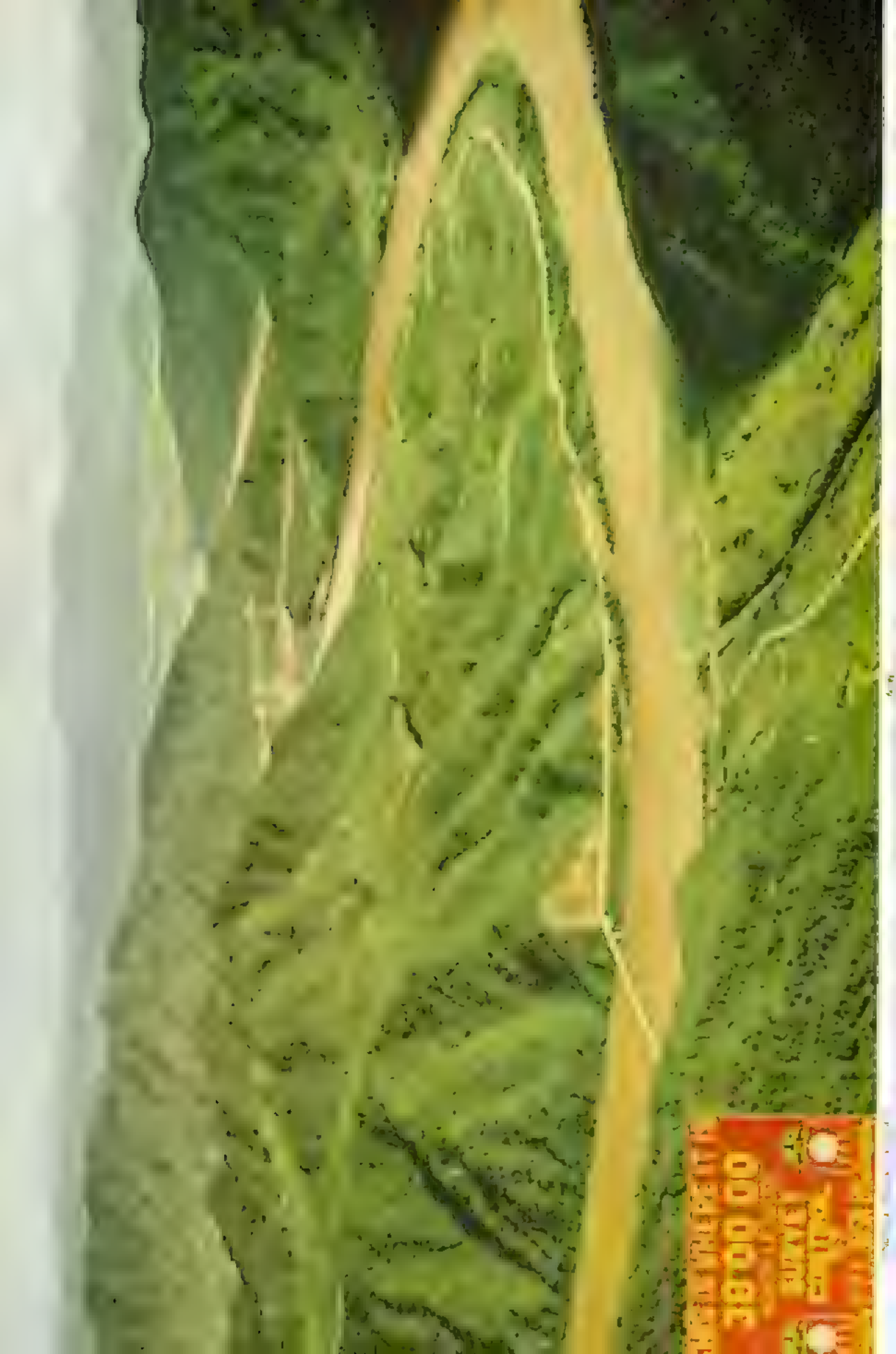
1. Knowledge - how much you  
 know about the business  
 and the market conditions  
 2. Experience - how long you  
 have been in the business  
 3. Connections - how many  
 people you know in the  
 business  
 4. Capital - how much money  
 you have available  
 5. Skills - how good you are  
 at what you do  
 6. Reputation - how people  
 think of you  
 7. Network - how many  
 people you know  
 8. Resources - how much  
 money you have  
 9. Time - how much time  
 you have  
 10. Energy - how much  
 energy you have  
 11. Health - how healthy  
 you are  
 12. Age - how old you are  
 13. Gender - how old you are  
 14. Ethnicity - how old you are  
 15. Religion - how old you are  
 16. Marital Status - how old you are  
 17. Children - how old you are  
 18. Parents - how old you are  
 19. Siblings - how old you are  
 20. Spouse - how old you are  
 21. Friends - how old you are  
 22. Neighbors - how old you are  
 23. Community - how old you are  
 24. Society - how old you are  
 25. World - how old you are

[illegible]

The common objective of the two models is to provide the user with a means of controlling the system, and to provide the user with a means of controlling the system.

[illegible]













### Four Hundred Pounds of Flour Move by Korea's Chief Burden Bearer: Man

The rugged, bearded Korean laborer has been an indispensable part of the Korean economy in this war-torn and devastated land. He is the chief burden bearer, carrying on his back a heavy sack of flour, the staple food of the Korean people. The man is seen here carrying a sack of flour, a task that is both arduous and essential for the survival of his community. The image captures the physical strain and the vital role of these laborers in the face of adversity.









### Korean Hopes For Peace Rest on Eisenhower

It took only 100 hours after the first report of the Korean war broke out to see the American reaction. The United States, in a matter of days, had sent its troops to the Korean peninsula.

The United States, however, was not alone in its reaction. The Soviet Union, too, had sent its troops to the Korean peninsula.

The Korean war, which began in 1950, was the first time since World War II that the United States had been directly involved in a conflict.

The Korean war was a major test of the United States' military power. It was also a major test of the United States' political power. The United States was able to win the war, but it was also able to win the peace.







money (one Marine auctioned off in the States a picture of his 1½ inch mustache), and even spent their few hours of leave time playing morsecode, teacher, and back-scratcher. Two weeks later they went back to the front for another planeload.

This idea of seeing the job through is pretty well illustrated, I think, by Lt. Col. Dick Cleaves, who was chaplain of Marine Aircraft Group 33. When Cleaves helped to set up the Marine Memorial Orphanage at Paju-dong, he took part of the money the Marines contributed and bought land which the kids themselves could cultivate. Kids were adopted only as fast as rice paddies could be bought. The orphanage consists now of six buildings and more than 5,700 pyong of ricefields (a pyong is 36 square feet).

These few instances, of course, don't begin to cover all that the Marines have done, formally or informally, for the children they've met. And the other services have been just as active. You might not think the Navy got ashore enough to know what the kids' needs were, but I can tell you what the men of one ship did, anyway.

They were serving on the carrier USS *Kearsarge*, and they decided that the children they wanted to help would be those who had had it roughest. So they picked out an orphanage set up in an old Buddhist retreat near Seoul, a place where soldiers brought kids abandoned along the battle line. For this little mission, run by American medical missionaries, they collected more than 1,200 pounds of warm winter gear.

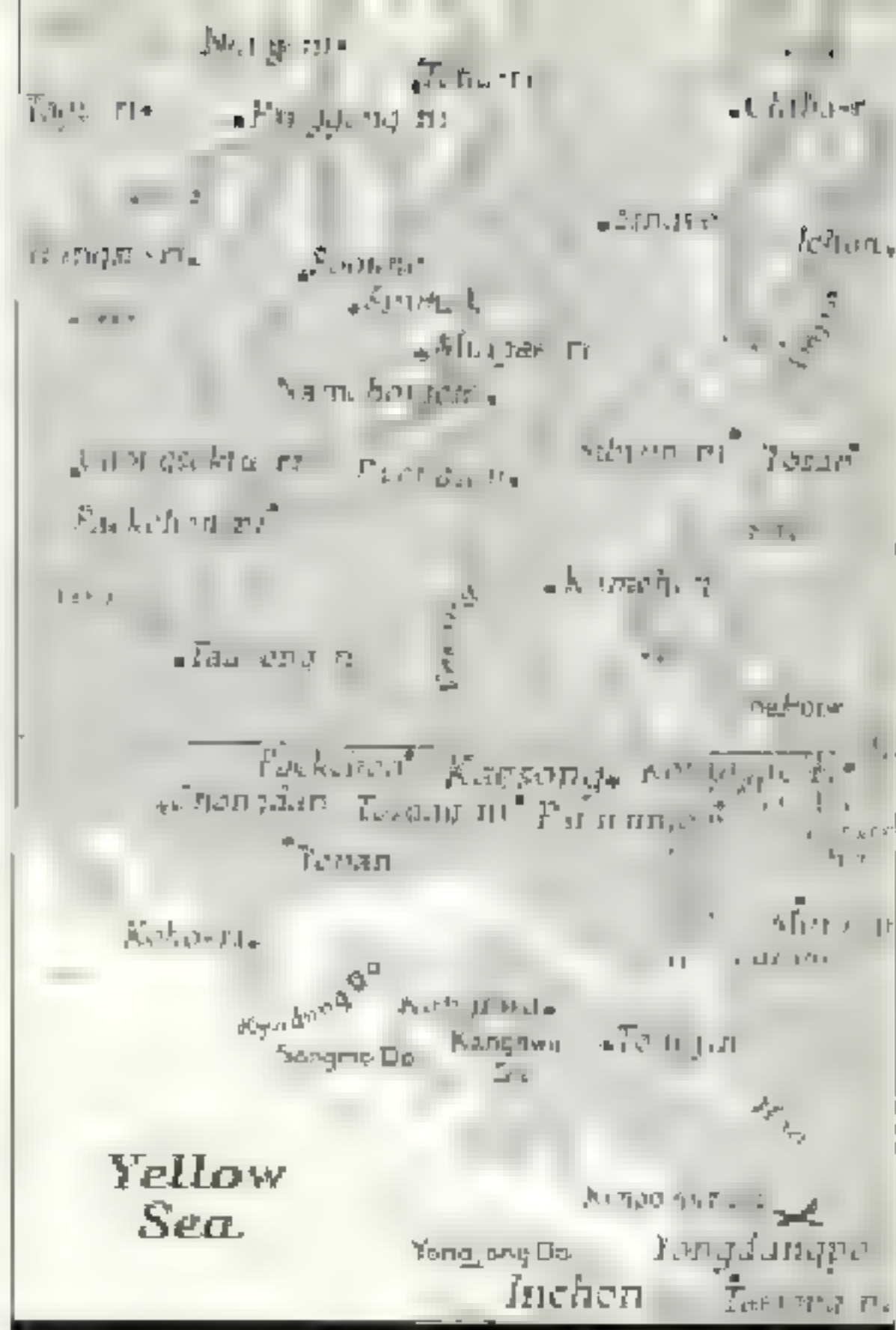
Navy units tend to pass the word along from ship to ship. Another one that did a real job was the heavy cruiser USS *Los Angeles*. Its crew rounded up big donations of cash and clothing for 10 different orphanages and hospitals in Korea.

I wasn't in Korea at the time of the Air Force's "Operation Orphan Annie," but I've heard about it. It was organized in December, 1950, when the Chinese were pushing us back, and it looked as if Seoul would have to be evacuated.

In the retreat we had picked up hundreds of babies—some of them sitting beside their dead parents, others just lost and huddled in the doorways of ten-hut buildings or sleeping on piles of rubble (page 661). Plans were made to ship them en masse to a safe island by a South Korean naval vessel.

But the ship never showed up at Inchon. So the Air Force Combat Cargo Command stepped in. Though they had work enough to do in the scramble that was going on to regroup all UN forces, they somehow rustled up 15 twin-engined transports, crowded 70 kids into each flight, and flew them southward out of Kimpo Airfield (page 638).

It was lucky they did; at least 100 of the



children were already too sick or weak to walk. The weather was freezing, and some of them had no more on than the straw sacks or thin rags they had been found in.

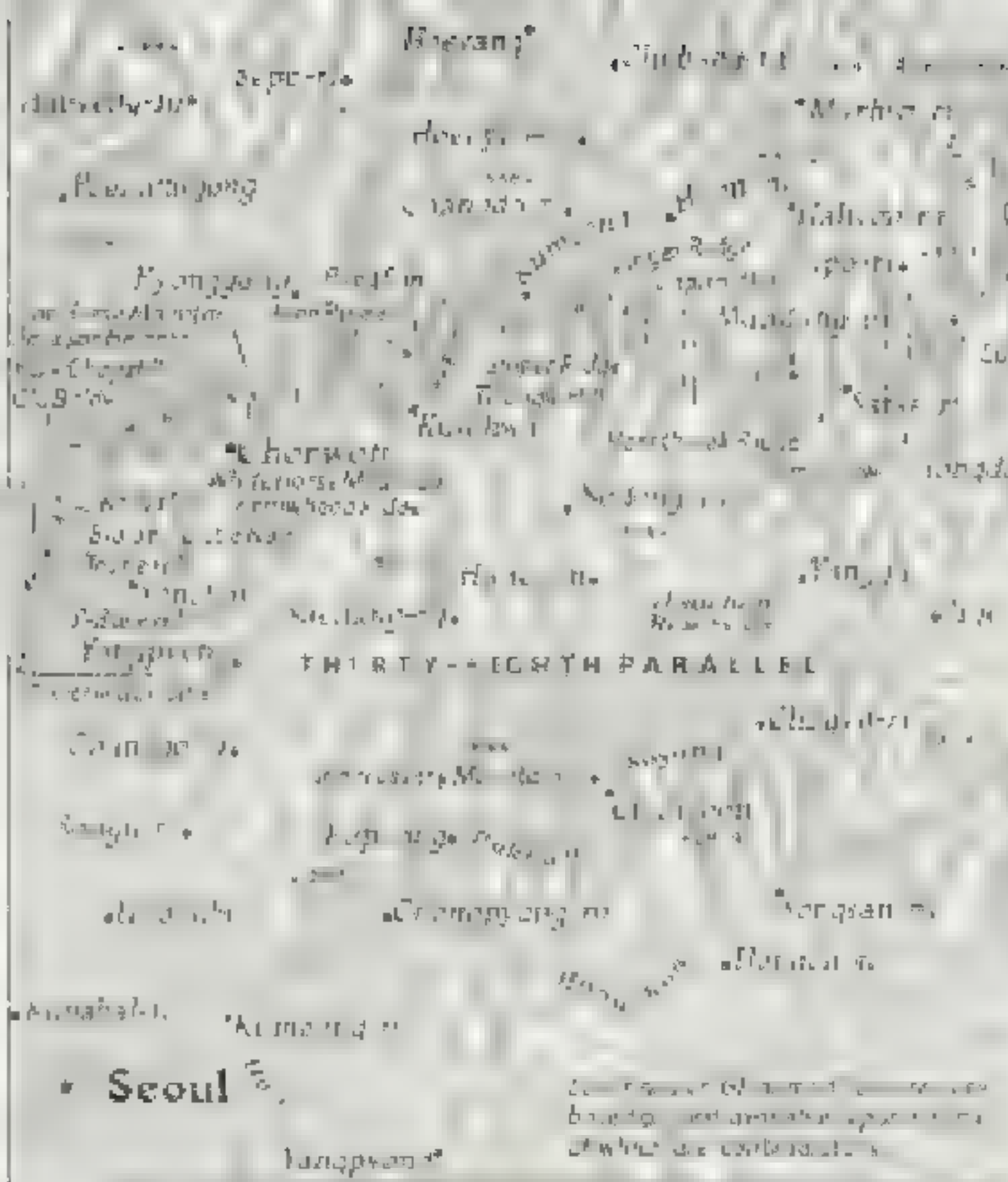
#### Airmen Return with Christmas Gifts

They arrived safely, though, and began life all over again on Cheju Do (Island). One thing that interested me was to read in the paper later that the airmen who had flown them in came back the following Christmas with a load (which they had paid for) of 2,000 lollypops, several Christmas trees, 1,000 rice bowls, 2,500 notebooks, 100 toothbrushes, and some sewing machines for the girls. Korea's "Orphan Annies" hadn't been forgotten.

What about the Army? All I can say is that whenever I picked up one of their news-sheets in the field (anything from a blurry mimeographed regimental bulletin to a printed division weekly), I ran across accounts of clothing drives, fund-raising campaigns, building projects, and Christmas parties for Korean kids. Half the time items like that would crowd world news or battle stories right off the front page.

I remember particularly the job the 40th Infantry Division did at Kapyong, 36 miles northeast of Seoul. This little town wasn't exactly a cultural metropolis, I guess, even before the war. But when the fighting had whipsawed through it five times, it really be-





# The GI's Korea

*Drawn to Show His Colorful Place Names*



## Orphan-making War Has Filled and Flowed Across Korea's Fatal 38th Parallel

gan to show signs of wear and tear. Most of the houses, in fact, and all of the schools had been thoroughly chewed up.

That hadn't stopped the Korean teachers and their kids. They used tents for classrooms. With winter coming on, however, they were facing some pretty chilly school days.

At that point the 40th Division stepped into the picture. Its commander, Maj. Gen. Joseph P. Cleland, conferred with Kapyong's officials about their needs. Then he went back to his own men and put it up to them.

Within three weeks the GIs in the 40th scraped up \$14,000—and an architect. He was First Lt. Robert F. Van Hoef, and he designed a long, low, modern school building which could take care of 600 kids. He even drew sketches of an auditorium and outdoor pool that could be added later.

That may sound fantastically ambitious. But \$14,000 can go a long way in Korea, especially if the labor is free. The people of Kapyong, short on money but long on energy, volunteered to perform all the manual labor and to provide the sand, stone, and gravel. They even set up a little sawmill.

The work wasn't all left to the men, either. They have Widows' Clubs in Korea, made up of women whose husbands were killed in the war. The local Kapyong chapter turned out, 150 strong, and unloaded the stone for the rock-and-cement foundation.

When the building went up, the townspeople had one last request. They wanted to christen it. And the name they picked for it was Kaiser—for Sgt. First Class Kenneth Kaiser, Jr., of Los Angeles. Why? Because he was the first man from the 40th to be killed in combat in Korea.

### "Boys' Town" Comes to Korea

There's another project you ought to know about. That's the Children's Democratic Town on Chin Oo Do, off South Korea. It was set up by Lt. Col. John C. Keefe, 1st of the United Nations Civil Assistance Command Korea, in the spring of 1951, when UNAC was getting worried about the gangs of orphans roaming the streets of Pusan, begging and stealing for their living.

Keefe was interested in doing more for the kids than filling their stomachs—though that was a job in itself. He wanted to show them what democracy was all about, by having them live it.

The island he took them to was just a barren rib in the sea, so unimportant that nobody had ever bothered to name it. But the children did. They called it Chin Oo Do, which means "Island of True Friends."

Under Keefe's guidance, the town's 190 boys and 30 girls organized themselves into a community run on the honor system. Each month they elect their own mayor and mayor











and departmental officials. Each tent has a judge, and the island as a whole has a high judge. Twenty boys make up the police force.

They had a rough go of it at first. Their tents were unheated; their blankets were spread on beds of seaweed. Clothes were scarce and rations uncertain. Now these kids are trying to become more self-sufficient by growing truck gardens, raising poultry, and fishing.

They wouldn't have pulled through, however, without relief packages, and they've shown their recognition of it by naming their tents after the cities from which the gifts have come. Streets in Ch'a On Do form a kind of roster of UN charity—Washington, New York, Sydney, Bangkok, Jerusalem, London, Manila, Paris. . .

Furthermore, the kids don't lose sight of the principles on which their town is supposed to be run. The lane up from the dock is studded with placards that read: "Absolute Honesty. Absolute Purity. Absolute Unselfishness. Absolute Love. No Hatred. No Fear. No Covetousness. New Man. New Country. New World."

#### A Big Drop in a Big Bucket

Quite an order. But the kids seem to think they can pull it off. At any rate, they've strung up a bell made of six shell casings. They call it the "Holy Bell of Change," and the inscription reads: "This bell changes everything. Things evil good; things good better. . . ."

These were hopeful things to mull over, jelling through the mountains on the long road back to the front. I knew we Americans were doing a bit, one way or another, to relieve the misery around us. Yet it still seemed a drop in the bucket. A big drop; but a big bucket, too.

The figures we usually heard put the number of Korean refugees at 3,500,000, the number of orphans at 100,000—this in a nation of 20,000,000. If so, what's the ratio of disaster to our own population of 138,000,000. It would mean more than 27,000,000 Americans blasted out of their homes and turned onto the roads with not much more than a rucksack to their backs. Moreover, it would mean that those hordes of refugees would be pressing back upon cities and farms never really rich and now thoroughly ripped on by war.

Stacked up against calamity on a scale like that, our best efforts can't look like much. And I couldn't help wondering what will happen to Korea's children when the Marines and the GIs and the other troops pull out—a day that will have to come sometime.

It came for me in July of last summer. Our

division was ordered to Munson, and the commanding general passed the word down that all Korean civilians not essential to military operations would have to retire to the rear areas. That meant Kim, among others.

Kim could have returned to the refugee camp where I had found him. But it had no school, and we both agreed that school was what he needed most. So I fixed him up with some money, clothes, odd bits of gear, and candy, and put him in charge of a friend in the motor-transport pool who would drop him off at Hungnam. We said good-by.

As it turned out, I could have saved my breath, because Kim was back in a week. He said he was sticking with me for good.

"What about the general's order?" I inquired.

"You take me to general. I explain him."

I wasn't exactly on those terms with the general at the time, so I told Kim he would really have to go home. He cried. I came fairly close to it myself.

In the end, though, he went, clutching a three-cell flashlight and a watch which I couldn't help giving him. But he wasn't looking at the presents as he left. He was looking at me. Sitting up in the cab of the six-cylinder, he suddenly seemed very small and very young.

I never heard from Kim again. I didn't give him any forwarding address, and I didn't write him. He had his own life to take up again, among his own people, and I figured it would only sidetrack him to keep alive his hopes—the hopes almost any Korean kid has—of coming to America, and living in the miraculous steel-and-carmine world of the *Illustrated* magazines.

#### This Much Will Remain

Will Kim remember me? Will the Korean people in general remember the GIs whose job it was to break and smash and burn things, but who tried to mend what they could and to blot the tears off at least a few grimy cheeks?

When all is said and done, I think the Korean children won't forget us in a hurry. I came across a letter, once, written by the children of an orphanage near Inchon to the crew of the USS *Los Angeles*. It says, in its own odd way, what I believe a lot of Koreans would like to say:

"This civil war have made plenty of poor orphans who are lost their parents and warm cradle. They were wandered on the cold street during cold winter night, but now this orphanage fortunately have men like you who are very kind helper in the world especially UN force. We have feeling very thankful day and night."



## Prayer Women Grind Corn by Hand Near Hongkong

Like many in America, Matteo de la Cruz, a priest from the Philippines, has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn.

The priest has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn.

Matteo de la Cruz, a priest from the Philippines, has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn.

Matteo de la Cruz, a priest from the Philippines, has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn.

Matteo de la Cruz, a priest from the Philippines, has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn.

© National Geographic Society

Kathleen A. Smith, a priest from the Philippines, has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn. He has seen the need for a more efficient way to grind corn.









#### 4. A Marine Tank Dug In at a Frozen North Korean Ridge for Direct Fire into the Enemy's Positions

Marine Corps Lt. Major Vernon M. Dwyer and his men dug in a tank directly in front of the enemy's positions. The tank was used to fire directly into the enemy's positions. The tank was used to fire directly into the enemy's positions.

For more information, see the book "The Marine's Book of Days" by the author.

1951





## Lure Baiting at Kōkōte for the Morning Scrub at Hwaseon

Korean who have been charged with the task of luring the birds to the traps. The birds are then caught and taken to the traps. The birds are then caught and taken to the traps. The birds are then caught and taken to the traps.

After the birds are caught, they are taken to the traps. The birds are then caught and taken to the traps. The birds are then caught and taken to the traps.

The birds are then caught and taken to the traps. The birds are then caught and taken to the traps. The birds are then caught and taken to the traps.

— *Seoul National University*





## Churchmen Often Seek Secrecy in a Bank's Tabled Black of Granite

Little saints need not be shyly hidden if they can wear their purple and their hovers too. They that go to the church must first go to the church.

A churchman is for the most likely to be found in the church. If a person is a churchman, all the more likely he is to be found in the church. A churchman is a churchman, just as a churchman is a churchman.

and

the churchman is a churchman







### Maria's Meeting from "Gather about the Songs of Home"

Redding, N. H. Mary was born at Redding, N. H., where she lived until she was twenty years of age. She was educated in the common schools of her native town, and at the Redding Academy. She is now residing in New York City, where she is employed as a teacher in a school.



## Napalm Swept an Enemy Bunker to Liquid Fire

For in Manila, with  
the American soldiers  
in the last of the  
war, the enemy  
bunker was swept  
to liquid fire.

When the enemy  
bunker was swept  
to liquid fire, the  
American soldiers  
in the last of the  
war, the enemy  
bunker was swept  
to liquid fire.

For in Manila, with  
the American soldiers  
in the last of the  
war, the enemy  
bunker was swept  
to liquid fire.

When the enemy  
bunker was swept  
to liquid fire, the  
American soldiers  
in the last of the  
war, the enemy  
bunker was swept  
to liquid fire.

For in Manila,







THE NEW YORK TIMES

664

THE NEW YORK TIMES

### War or No War, Man and Beast Must Go On Tilling Korea's Rice Fields

Even if the political situation in Korea does not favor the continuance of the war, however, Japan, Germany and the United States must not forget that the land is still a part of the world, and that the rice fields are still the source of life for the Korean people.

During the past few years, the Korean people have been working hard to make their land more fertile and to increase their production. This is a task that must be continued, no matter what the future of the country may be.





BY VOLKMAR WENTZEL

*National Geographic Society Staff Photographer*

*With Illustrations from Photographs by the Author*

**A**JAANTA, I read, "is the most splendid and priceless art heritage handed down to India." And Kailasa Temple at Ellora, the noblest Hindu monument of ancient India "is man's idea of a god's heaven.

Such descriptions, read as I traveled to India, helped to prepare me for an assignment by the National Geographic Society to photograph these extraordinary shrines in the State of Hyderabad. Months later, gazing upon carvings and frescoes, I understood why Ajanta and Ellora had evoked such praise.

Both religious centers were carved with infinite patience from the living rock. Monks, priests, and laymen worked by sun and torchlight for more than a thousand years on 60-odd temples and halls.

## Frescoes Picture Ancient Life

Ajanta monastery was settled two centuries before the Christian Era, when followers of Gautama Buddha retired to that lonely pinnacle. There with mallet and chisel they dug into the rock and hollowed out nearly 30 temples and dwelling halls. On the walls and ceilings they painted exquisite frescoes portraying the life of ancient India.

In the 7th century the Buddhists mysteriously abandoned Ajanta to the jungle and moved to a hillside near Ellora, 50 miles away. Hindus and Jains joined them. During the next 200 to 300 years, the three sects carved another 30-odd temples.

I drove up to the Ajanta guesthouse at twilight. Leaving my Sikh assistant, Jag Singh, I walked off alone to see the temples before darkness closed in.

Soon I stood in the sweeping crescent of the wild Waghara River, gazing at a cliff that rose a sheer 250 feet from the stream bed (page 608). My eye was caught by four rock-hewn temples with cyclopean-eyed windows (page 606). Connecting them, massive columns marched 2,000 feet around the river bend. Behind those pillars lay the dwelling halls of monks who attended the temples.

As I strolled the path beneath the porticoes, I could imagine the bygone Buddhist monks walking as I walked, meditating, chanting prayers, and teaching students.

Visiting a monks' hall, I trod paths worn in the stone floor by the feet of countless pilgrims. I paused before shrines which showed Buddha in life (page 667) and in Nirvana (page 670). I explored cubicles where austere monks had slept on stone beds and pillows.

But it was not until the next day, when

I set up lights for my cameras, that I noted Ajanta's artistic triumphs—the frescoes. Color still glowed from painted walls; flowers a thousand years old sparkled like jewels. Vivid figures seemed to move with life. Gift-bearing ladies served godlike kings. Dancing dwarfs sang carols and played musical instruments.

But time had exacted a heavy price. The frescoes bore the marks of moisture, insects, and bats. Shellac, applied by restorers after Ajanta's rediscovery by British soldiers in 1819, had harmed rather than helped.

Later I spoke to an Indian friend about the tragedy of the paintings.

"Yes," he agreed, "much has been lost, but much has been won, too. The Ajanta frescoes, tattered as they are, have inspired a new school of art in Calcutta.

Visiting Ellora, we were guided by Livingstone M. Bhaktel, resident archeologist.

"During World War II," Mr. Bhaktel told me, "your American GIs came to Ellora in such droves that we had to put them up in tents. Our cook worked overtime preparing hundreds of box lunches. But the Yanks were nothing new, for Ellora has had sight-seers 13 centuries. Unlike Ajanta, it was never lost."

Ellora's temples stand out above a broad expanse of rolling hills. First the Buddhists dug out enormous halls; then Hindu and Jain sculptors fashioned temples next door. Under the talented Hindu artists, Indian sculpture reached a golden age. Their graceful and imaginative female figures have rarely been equaled (illustrations on following pages).

## Dream of Heaven Endured

We saved the god Shiva's Kailasa Temple to visit last (page 672). I had expected much. I discovered more. Accustomed to stone blocks and mortar joints, I found it hard to believe that not only the great temple itself, but obelisks, life-size elephants, and dancing gods were all carved in one piece. Quarry-men, starting work from the top of the cliff, laid bare a huge monolith for the sculptors.

"We estimate that the job took more than 40,000 stonecutters excavating 200,000 tons of rubble," said the archeologist. "Then the artists went to work. Finally, plasterers covered the temple walls and sculptures with a fine lime that shone as white as snow and glistened for miles away—a dazzling abode for Shiva."

Plaster was peeling and statues had been chipped by image breakers, but the builders' bold dream of a god's heaven endured.





566

# Buddhist Monks Carved a Jewe box Facade out of the Living Basalt 1,400 Years Ago

When the monks of the 5th century AD carved a 200 foot long facade out of the living basalt at the entrance to the cave, they carved a facade that was a masterpiece of Buddhist art. The facade was carved into the living basalt and was a masterpiece of Buddhist art. The facade was carved into the living basalt and was a masterpiece of Buddhist art. The facade was carved into the living basalt and was a masterpiece of Buddhist art.











# Chained Buddha Breaks in a Yellow Cave

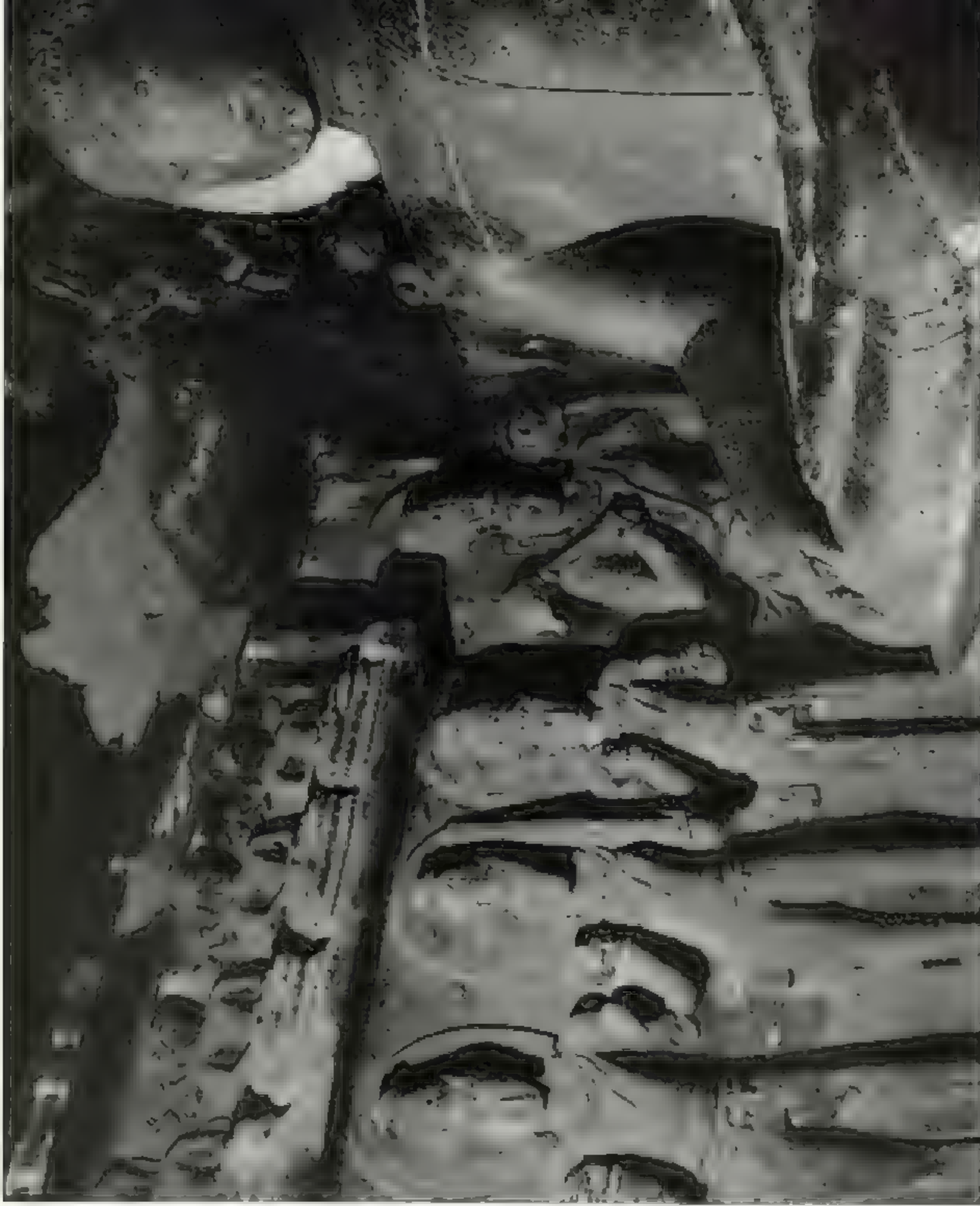
When I was a young man, I was a Buddhist. I was a Buddhist in a way that was not just a matter of religion, but a matter of life and death. I was a Buddhist in a way that was not just a matter of religion, but a matter of life and death.

When I was a young man, I was a Buddhist. I was a Buddhist in a way that was not just a matter of religion, but a matter of life and death. I was a Buddhist in a way that was not just a matter of religion, but a matter of life and death.

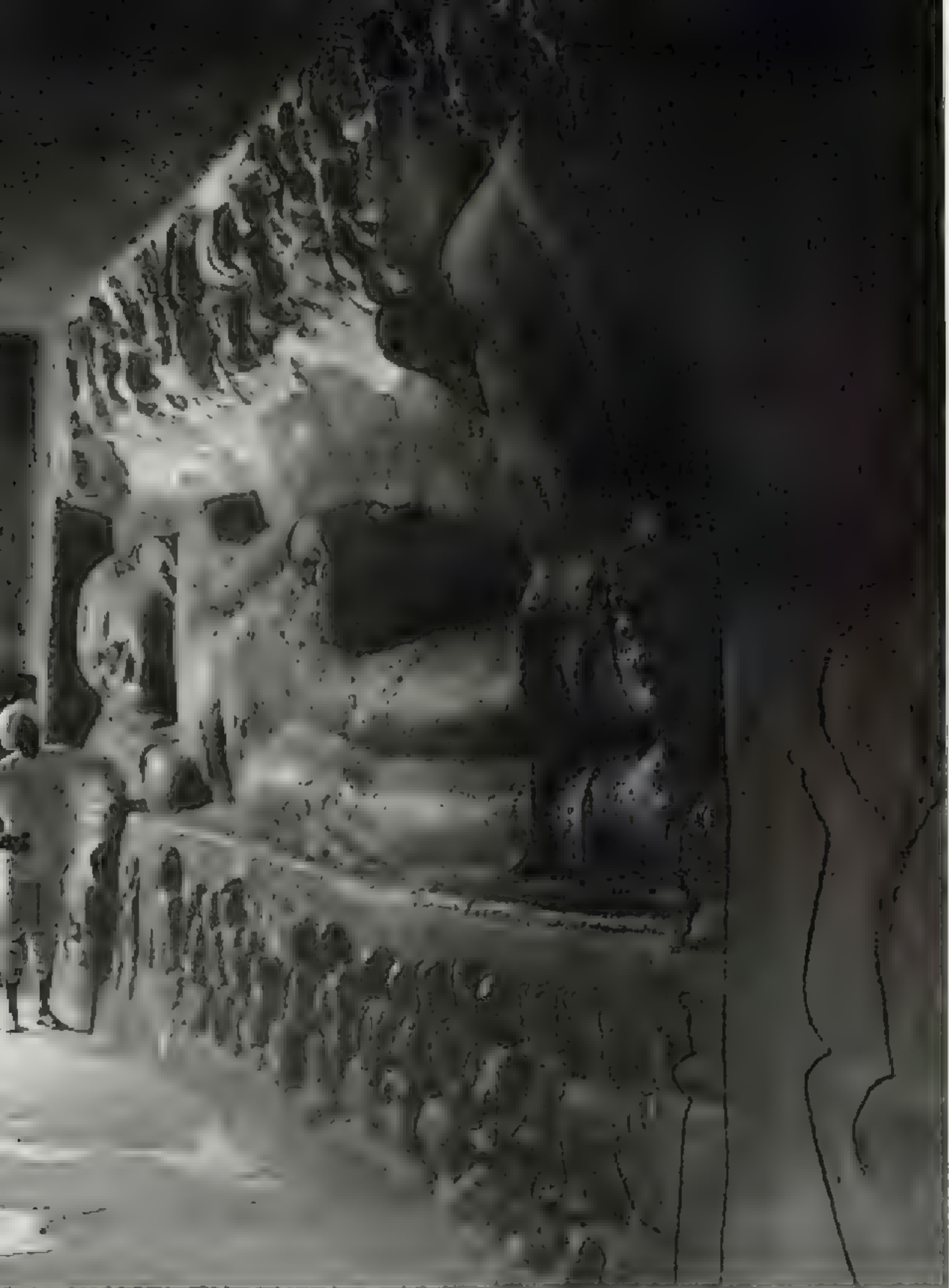
All to which I have been witness. I have seen the Buddha in a way that was not just a matter of religion, but a matter of life and death. I have seen the Buddha in a way that was not just a matter of religion, but a matter of life and death.

For the Buddha, the Buddha is not just a matter of religion, but a matter of life and death. For the Buddha, the Buddha is not just a matter of religion, but a matter of life and death.

When I was a young man, I was a Buddhist. I was a Buddhist in a way that was not just a matter of religion, but a matter of life and death. I was a Buddhist in a way that was not just a matter of religion, but a matter of life and death.











61

# Manzeya, the Buddhist's Mass: A. Six Enthroned Before a Steps in Elora

General stone statue in a rock-cut niche, the statue of Buddha, who is seated in a meditative posture, with his hands in his lap. The statue is seated on a lotus throne, and the entire scene is carved into the rock face of the cave.





# Kailasa Temple Floor & Glory Was Carved from the Top Down out of Living Granite

The carvings of the temple were made by the same people who carved the famous rock-cut temple at Ellora. The temple was carved from the top down out of living granite. The carvings of the temple were made by the same people who carved the famous rock-cut temple at Ellora.

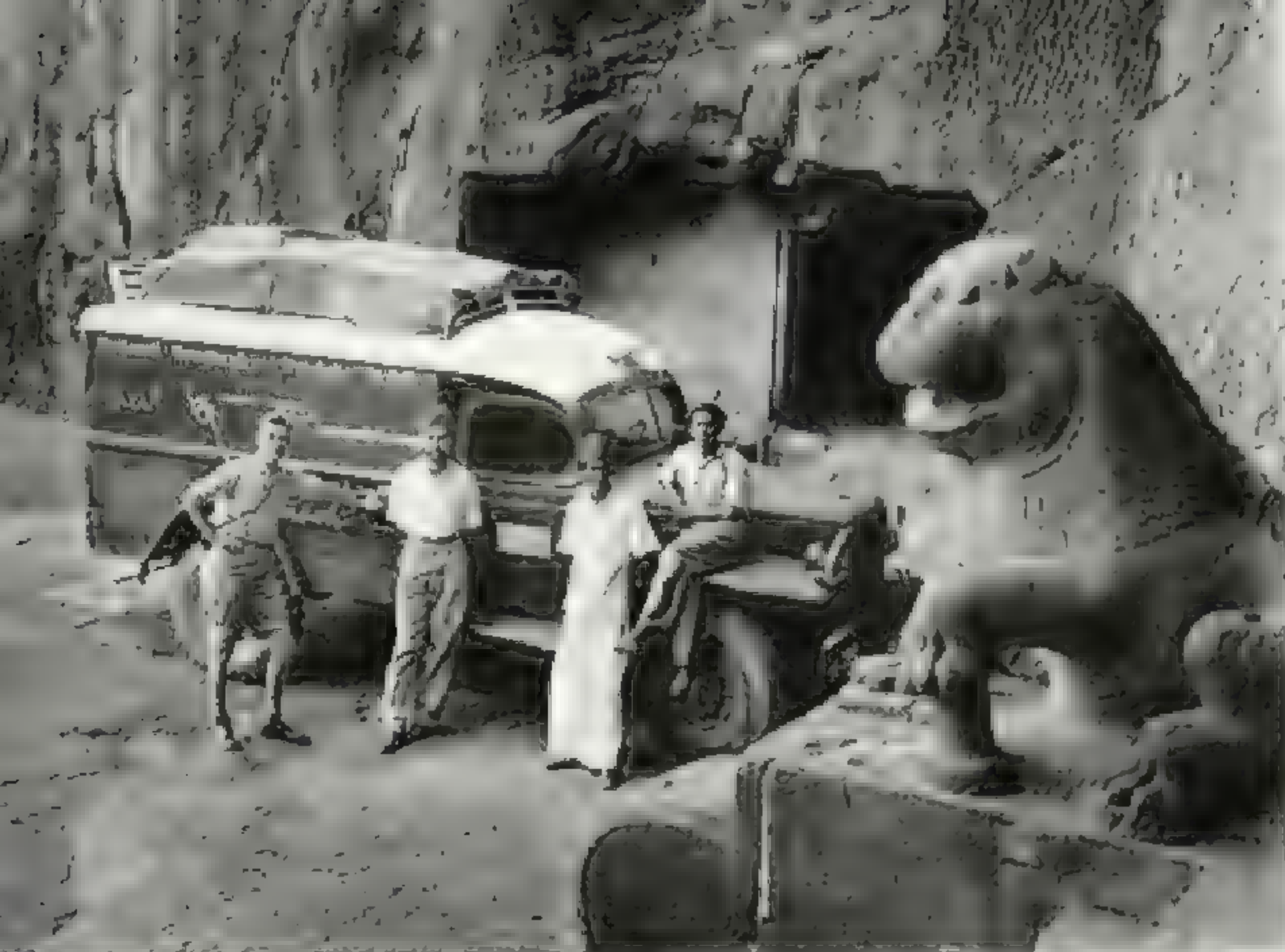




### Excavators Removed a Hillside to Expose Solid Rock for the Hindu Sculptors

The temple is a rock-cut structure, and the hillside was removed to expose the solid rock. The temple is a rock-cut structure, and the hillside was removed to expose the solid rock. The temple is a rock-cut structure, and the hillside was removed to expose the solid rock.





A Weathered Stone Lion Guards the Entrance to Sura's Hall, an Entry Cave

John Henry Wood, a 41-year-old married African American, is a member of the National Geographic Society. He is the fourth of seven African American employees. He has been with the Society since 1972, and he has worked in a number of positions, including the following: Mr. Wood worked in the Society's plant in their Washington, D.C., headquarters; he did special photography; he worked in the library.



\* **Shin Destroyer  
with Many Arms**

The Westminster and the Herald, however, are not content with the simple fact of the new party's coming into existence. They say that the Liberal Unionists have, under the leadership of Mr. Stansfeld, been engaged for some time past in a series of negotiations with the Conservatives, with a view to forming a coalition government.

It is important to understand that the results of this study are not generalizable to all populations. The study was conducted in a specific population and the results may not be applicable to other populations. Therefore, the results of this study should be interpreted with caution.

[illegible]
$$\|U_{n+1}(t) - U_n(t)\|_{L^2(\mathbb{R}^d)} \leq C \|U_n(t) - U_{n-1}(t)\|_{L^2(\mathbb{R}^d)}.$$











2000  
 2001  
 2002  
 2003  
 2004  
 2005  
 2006  
 2007  
 2008  
 2009  
 2010  
 2011  
 2012  
 2013  
 2014  
 2015  
 2016  
 2017  
 2018  
 2019  
 2020  
 2021  
 2022  
 2023  
 2024  
 2025  
 2026  
 2027  
 2028  
 2029  
 2030

[illegible]

11.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 12.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 13.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 14.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 15.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 16.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 17.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 18.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 19.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$   
 20.  $\frac{1}{2} \pi + \frac{1}{2} \pi = \pi$

[illegible]





678

### McLevel Sculptors Give This Mother the Hourglass Waist of Victorian Times

A sculptor and his wife have carved a life-size marble sculpture in the style of the Victorian era, showing a mother with a child. The sculpture is highly detailed, showing the texture of the marble and the folds of the woman's dress. The woman has a serene expression, and the child is nestled in her arms. The background is dark and indistinct.



# Macau, a Hole in the Bamboo Curtain

679

By GEORGE W. LONG

*With Illustrations by National Geographic photographer J. Harold Roberts*

**O**N THE border between Red China and the tiny Portuguese colony of Macau I watched traffic ebb and flow between two worlds.

Through the Barrier Gate barefooted farmers, trotting under creaking shoulder poles, brought fruit and vegetables from China. Slender Chinese girls carried stacks of small blue boxes made at home for a match factory in Macau.

Squawking chickens and sway-neck pigs arrived in big rattan containers. Flocks of live ducks crossed the line, slung head down over the rear wheels of bicycles.

The only China-bound traffic I saw was an almost empty model-T bus and a gang of men carrying crude wooden coffins of Macau Chinese who wished to be buried in China soil. Red guards open even these to make sure they hold no contraband.

Portuguese officers kept careful watch but stopped no one. Near by, a jet-skinned guard from Mozambique faced a Red Chinese sentry.

"There's trouble now and then," said the captain in charge, "but it always blows over. Sometimes a Chinese guard tries to pull one of our African boys over the line. Then anything can happen."

Drumbeats sounded across the frontier. The captain smiled. "Morning indoctrination class to cleanse the thoughts of those farmers who must set foot on our soil," he explained.

## Peephole and Listening Post

So small is this peephole in the Bamboo Curtain around Red China that most maps of the Far East show the colony as a mere dot. It covers a bitty peninsula only three miles long and a mile wide on the South China coast across the broad Pearl River (Chu Kiang) estuary from Hong Kong.\*

Including two small islands—Taipa and Coloane—the whole colony totals only six square miles, but it supports some 300,000 people. About 99 percent are Chinese, many of them refugees.

Because of its location and its neutrality, Macau remains an important listening post. An agent of a foreign power may be sitting at the next table.

Macau was founded four centuries ago about the time the first Elizabeth ascended England's throne. It was Europe's earliest foothold and Christianity's first beachhead in

China. No flag but Portugal's has ever waved above it. In its old Protestant Cemetery I found weathered tombstones carved with names of New England traders and sailors.

Today Macau is a strange blend of southern Europe and the Orient, the old and the blatantly new, the good and the seamy.

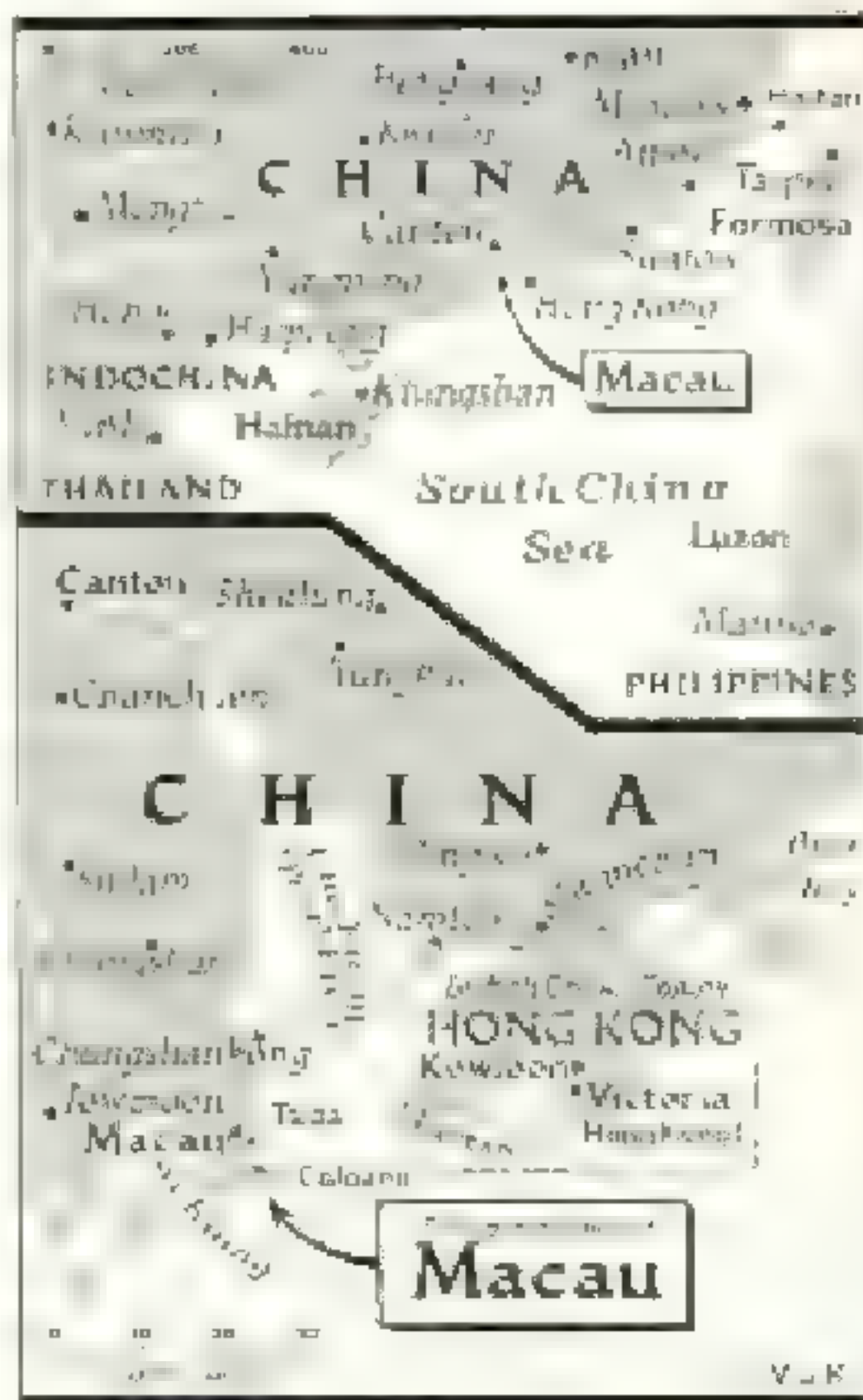
Over all lies the spell of sunny Portugal. Except among the Chinese, life is unhurried; there is a forever-siesta atmosphere. Church bells, rather than clocks, chime the hours.

Most of Macau's few thousand Portuguese belong to families that have lived in the colony for generations. Tenaciously they cling to the customs and manners of the homeland, but Macau is their first love.

"It is small, but it is so beautiful," they say.

## No Place to Go But Hong Kong

Even so, Macau Portuguese suffer from claustrophobia caused by the Bamboo Curtain. Wistfully they describe the good old days—picnics on the mainland, boat trips on West River (Si Kiang), and excursions to Chinese cities like Canton.



\* See "Macau (Macau), Land of Sweet Saffron," by Edgar Allen Forbes, NATIONAL GEOGRAPHIC MAGAZINE, September 1952.



"Except for occasional trips to Hong Kong," I was told, "we are shut-ins."

Approaching the colony by sea, I saw first its quiet Mediterranean-like face—a timeless Riviera town climbing the peninsula's low green hills.

As the boat from Hong Kong rounded this headland and steamed into the riverlike inner harbor, a modern metropolis slid into view. Tall buildings loomed above the water front, lights regulated traffic on busy streets, and big neon signs splashed the scene with color.

American and British goods filled stores along Avenida Almeida Ribeiro, the main business street (next page). Chinese shoppers stared at window placards in English advertising Kleenex, Parker 51's, Kodak film, tooth paste, and a variety of beauty aids. Coca-Cola signs were numerous, and street vendors sold a dozen brands of American cigarettes.

Downtown, in a maze of narrow streets festooned with laundry, I shouldered through crowds of Chinese in black pajama-like garb. It was bedlam, like a bargain basement sale.

Hawkers shouted, pedicab bells jingled, wooden sandals clattered, and itinerant second-hand dealers sounded iron clappers. From upstairs rooms came the loud, furious rattle of mah-jongg pieces being shuffled.

#### Live Fish, Dried Snakeskins Sold

I window-shopped and watched artisans making brooms, rope, incense sticks, claps, and fancy paper funeral pieces. In fish stores strange specimens in tanks stared back at me. Browsing in a Chinese drugstore, I discovered cures for every ill known to man, cures that included dried snakeskins, sea horses, lizards, and powdered boat tusks.

After dark the colony sparkles like a jewel against the black, forbidding hills of China. Lights of the business center set the sky aglow, and the latest in sodden, street lights turn night into day along the broad avenues.

How the tiny colony supports its teeming thousands is something of a mystery. "We take in each other's washing," was the way one Chinese I met explained the economic puzzle.

Chinese are the businessmen, artisans, shopkeepers, laborers, and fishermen. Small, largely nonmechanized factories turn out firecrackers (page 685), matches, sauces and preserved fruits, Chinese slippers, and textiles.

On the Barrier Gate is carved "Honor the fatherland and it will take care of you." Macau fulfills that promise and extends its care to thousands of refugees from China.

The colony has built living quarters for Government workers and large low-rent housing projects. Many institutions, some run by the Church, care for orphans, the sick, and the aged.

For years Macau has had a lurid reputation as a haven of opium smokers, smugglers, big-time gamblers, and sinister undercover agents. Long ago its name became synonymous with vice and cloak-and-dagger intrigue.

Macau people are concerned about this. "It is greatly exaggerated," they say. "It was true years ago, and even after the last war, but not now."

#### Opium Regulated, Gambling Curbed

The colony strictly regulated the use and sale of opium in 1946 and has now closed all but one gambling place. Government-licensed and operating on several floors of the modern 14-story Central Hotel.

Like most visitors, I went to the Central. On one floor, Chinese, Europeans, and turbaned Indians quietly played *kasec*, a dice game. On another I watched fan-tan.

At the head of a table ringed with players sat a fat, bald Chinese who looked like a Buddha. He held a slim ivory stick, and before him glistened a silver chalice upside down.

"Under the chalice is a pile of ivory buttons," a friend explained. "Buddha counts them four at a time with his baton. Players bet on whether 1, 2, 3, or 4 will be left over."

A bell rang; bets closed. Slowly, deliberately Buddha counted. Almost before he began, old habitués held up fingers to show the winning number. I never saw them miss.

Macau people gamble on more than dice and buttons. They are gambling on the future of their little garden spot on Red China's border, and they show little or no apprehension.

"We're in a tight spot, of course," Macau's Governor told me. "Every bit of our food comes from the mainland. We must trade with China or die. We keep strictly neutral always."

Over the centuries that policy has paid off. Macau has got along with Ming, Manchu, Nationalist, and—so far—with Communist leaders in China. Even the Japanese did not take Macau during World War II. Tiny as it is, and often threatened, it has remained, under one flag longer than any other European settlement in the Far East.

© National Geographic Society  
Published by National Geographic Society, Washington, D. C.

#### "Welcome!" Exclaims Macau, a Bit of Portugal in the Orient

Though Portugal has ruled this small colony four centuries, Chinese comprise the overwhelming bulk of its 300,000 people. These gaudy street signs show how Chinese merchants dominate retail trade on Avenida Almeida Ribeiro, Macau's business center. Usually the avenue swarms with pedestrians, bicycles, and pedicabs. Here it is spanned with a triumph arch erected as a greeting to Portugal's Minister of Overseas Territories, who paid an official visit in June, 1952.



國  
際  
大

BEIYINDO

鎮滙長部文慧羅迎歡

長滙鎮

鎮滙大銀行







Fishing Junks Play a Daily Drama Below Battery Point. Red China's Grim Hills form Across Water Harbor

Below Battery Point, the water is a deep blue. The hills are a grimy red. The water is a deep blue. The hills are a grimy red. The water is a deep blue. The hills are a grimy red.













## A Newer The Road, Rise in New Ideas: the New Toward Center Will

7000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000 29000 30000 31000 32000 33000 34000 35000 36000 37000 38000 39000 40000 41000 42000 43000 44000 45000 46000 47000 48000 49000 50000 51000 52000 53000 54000 55000 56000 57000 58000 59000 60000 61000 62000 63000 64000 65000 66000 67000 68000 69000 70000 71000 72000 73000 74000 75000 76000 77000 78000 79000 80000 81000 82000 83000 84000 85000 86000 87000 88000 89000 90000 91000 92000 93000 94000 95000 96000 97000 98000 99000 100000







Portuguese Sailors March Past Local Houses of the Praia Grande. Helmed African Soldiers from Mozambique Present Arms  
A March band of men in white uniforms with red hats and sashes, marching in a line. In the foreground, a group of men in white uniforms are standing. Two men in red uniforms are shaking hands. In the background, a large, ornate building with a central dome and many arched windows is visible. The scene is set outdoors with trees in the background.











# Silkworms in England Spin for the Queen

In a 15th-century Castle, Thousands of Pampered Larvae Make Silk for Elizabeth's Coronation Robe

By JOHN F. H. NOLAN

ONE April morning in 1952 a letter bearing the royal coat of arms arrived at Lullingstone Castle, stately and historic home of Zet Lady Hart Dyke, pioneer of silk raising in 20th-century Britain.

"Her Majesty," the letter said, "would be pleased if the silk for the Coronation Robe could be supplied by the Silk Farm at Lullingstone."

Lady Hart Dyke at once announced the good news to her staff of young silk workers. There were cheers, and some quoted the silk farm's motto: "Patience and perseverance turn mulberry leaves into the silken robes of a Queen."

Young Elizabeth is not the first English Queen to be associated with the estate of Lullingstone, which has witnessed more than 800 years of history. Queen Anne was a frequent visitor, first as a child and later as ruler from 1702 to 1714.

The castle, built almost 500 years ago, nestles in Kent County's scenic Darent Valley, 17 miles southeast of London (page 692). It takes its name from the original estate of Lullingstone, which was listed in the Domesday Book in 1086 as the property of Odo, French Bishop of Bayeux, half brother of William the Conqueror.

Traditionally, the name Lullingstone came from the peaceful sound of the waters of the Darent River falling over stones on their way to the Thames.

## How Silkworms Came to Lullingstone

Even more fascinating to me is the story of Lullingstone today. Here, in the short space of 20 years, Lady Hart Dyke has established a silk farm which not only attracts world-wide attention, but has received royal patronage.

Beginning with a handful of silkworms and a few mulberry leaves, Lady Hart Dyke struggled against pessimism and apathy to prove that Britain could produce raw silk as fine as the best from China and Japan.

Silkworms were brought to Europe in the 6th century, when two monks risked torture and death by smuggling a few of the prohibited eggs from Persia. The Oriental monopoly of the golden thread was thus broken, and from this one daring act all silk raising in the Western Hemisphere originated.\*

At Lullingstone I saw the same methods of rearing the worms to the cocoon stage as had

been perfected by the Chinese around 2000 B. C. Only the incubating and reeling operations have been improved.

The director's late husband, Sir Oliver Hart Dyke, designed and built the machinery for unwinding the cocoons. Her ladyship imported thousands of eggs and mulberry cuttings, and numerous books for studying the subject. To learn more about it she went to Italy and visited silk mills at Milan before starting the farm in 1932.

From the Palestine Government's nursery at Nablus, Lady Hart Dyke obtained 4,000 mulberry trees. From France she imported a few pounds of white mulberry seed, which she planted under glass.

Near the farm's herb garden, her veteran gardener, Tom Barker who has served the family for more than 40 years, tended row upon row of seedling mulberries. Now there are 22 acres of mulberry trees.

In the castle itself, aided by three local girls, Lady Hart Dyke set up the incubation rooms, reeling and testing machines, and other equipment.

## School Children Help Robe a Queen

By 1936 the silk farm was a great success. Inquiries poured in from many countries. People of all ages wrote or came to purchase eggs and mulberry seeds for starting their own silk farms. Her ladyship now buys back suitable cocoons raised all over Britain, mostly by school children (page 690).

Continuing the royal contact with Lullingstone that has existed since its first stone was laid, Her Majesty Queen Mary displayed great interest when visiting the farm. She asked Lady Hart Dyke the most searching and difficult questions about sericulture, and upon leaving, graciously accepted a length of green silk damask.

Then came the most important event in the silk farm's history up to that time. It was 1937, and Lullingstone was chosen to provide 20 pounds of raw silk for the coronation robe of King George VI's Queen, and for the robes of the little Princesses, Elizabeth and Margaret Rose.

The farm's maximum output was then only five pounds of raw silk a week, but, to fill the royal order, 20 pounds had to be produced in two weeks. This meant running the machines

\*See "Spain's Silkworm Gail," by Luis Murillo, NATIONAL GEOGRAPHIC MAGAZINE, JULY, 1951.





699

### Children Count Cocoons, Their Silken Contribution to the Queen's Coronation

For each cocoon she spun, the young women and girls received a farthing, and for every five farthings they were allowed to purchase a penny. The girls were given a farthing for each cocoon they spun, and for every five farthings they were allowed to purchase a penny. The girls were given a farthing for each cocoon they spun, and for every five farthings they were allowed to purchase a penny.

24 hours a day with the help of three working machines a mile from home. But the order was completed on time.

Charles Spencer, a local girl, told me how she and her two sisters, who in Lady Hart Dyke's machine office during that month made the same room from which Anne Hart, a 17th-century daughter of the house, escaped through an open window into the arms of her lover, handsome John Blunt.

#### In the Path of Flying Bombs

With the coming of World War II, the peace of the Island Valley was richly broken. During the first months nothing serious happened, but as time passed many bombs fell over the quiet of Lillingstone.

In the summer of 1944 death came to the place when Hart's flying bombs either cut out overhead or scuttled past with a noise like a thousand rattling tin cans.

Seen the valley became known to the enemy as "Landing Area" for between its banks rose the Parent River, a tributary of the Thames, the winged bombs sped to war by the enemy.

During that summer of trouble there were more than 200 tons of all types of bombs and shells of the Parent. Ancient castles and castles were smashed or badly damaged. The town of Lillingstone was a mass of noise and fuss more than the silkworms.

Miss was killed in the morning when a flying bomb fell near her house. Worn by the bomb, she was killed by blast or cut to pieces by flying bomb.

Falling ceilings, broken windows and broken furniture were put out of action. Cracks appeared in the stone walls of the Tudor gatehouse, and from its tower a tattered Union Jack fluttered defiantly over the smoke-filled valley.

For several nights Lady Hart Dyke slept in her bedroom, always ready to draw protecting cover over their beds. Often she had to throw herself on the floor when a flying bomb fell near the water, and as it fell, a great

#### Trees Burned by Incendiaries

One morning Lady Hart Dyke was in her garden with her two children, and the night was dark and the wind very strong. The trees were in a state of alarm, and the night was dark and the wind very strong. The trees were in a state of alarm, and the night was dark and the wind very strong. The trees were in a state of alarm, and the night was dark and the wind very strong.

Lady Hart Dyke was at a loss, for there were not enough leaves to last another week. Suddenly she thought of the children who were flying kites in many parts of England. Northwith she received the following





### Silk Workers Follow Tullington's Banner in a Harvest Festival at Canterbury

At the 21st. Harvest Festival, when the work of the year is shown, the scene was one of the most beautiful ever seen in the city. The children of the city, dressed in their best, were seen in the streets, and the children of the city, dressed in their best, were seen in the streets, and the children of the city, dressed in their best, were seen in the streets.











advertisement, which appeared in 50 newspapers:

"HURRY! HURRY! Lady Hart Dyke would be extremely grateful for sacks of mulberry leaves for her silkworms. Will those kind enough to help please send their sacks by post or rail to Lullingstone Castle, Eynsford, Kent. Do please despatch as soon as possible after picking, as mulberry leaves ferment very quickly."

The response was amazing. In two days nearly half a ton of leaves arrived. Boxes, brown-paper parcels, even envelopes, were delivered by every post. More than 30 per cent came from children. The royal silkworms were saved.

In the midst of all this confusion 200 American colored troops arrived and were billeted in the castle's outbuildings. Most of them hailed from the Deep South. When off duty they volunteered their help to this brave but harassed woman. They displayed a natural aptitude for handling the worms.

Returning home late one night during a severe buzz-bomb attack, Lady Hart Dyke noticed a light glimmering from St. Botolph's Church in the castle grounds, a violation of blackout regulations.

Investigating, she saw two lighted candles on the altar, and the pews seemed to be filled with dark forms. Sharply she called out, "Who's there?"

"Oh, ma'am," came the answer, "it's only us boys prayin' for our God to save us from de ole doodlebugs."

### "Our Worms Hate Crowds"

Even before I reached Lullingstone, I began learning about its unusual industry. Walking to the castle from Eynsford, where the train had dropped me, I overtook two children, both carrying small baskets of silk cocoons.

The older child, a boy, told me the cocoons were a present for the Queen.

"Yes," said his girl companion, proudly, "the silk will be worn by Her Majesty on Coronation Day."

Near a Tudor cottage unscathed by the war, we met three people on horseback. The boy pointed them out as visitors to the castle.

"Hundreds of folk come to see the silkworms at Lullingstone," he said as he ran along beside me.

"But when there are too many people," his companion chimed in, "they have to wait their turn. You see, our worms hate crowds—they like lots of fresh air."

At the castle entrance we were met by Maj. R. Field B.Lb., manager and secretary of the silk farm (page 691). After the children had run inside to deliver their cocoons, the major strolled with me across the lawn and

smiled when I remarked on the fine quality of the turf.

"It should be good," he said, "for it was here that one of the earliest games of lawn tennis was played, in the late 1800's."

Three enormous cedars of Lebanon, almost 300 years old, flank one side of the castle; two have lost limbs to doodlebugs. Standing in the shadow of these stately trees is tiny St. Botolph's Church. Within, under sculptured effigies, rest members of past generations of the Hart and Dyke families.

At the annual Palm Sunday service, said the major, a special ceremony, Blessing the Silkworms, takes place in the sanctuary of St. Botolph's. Worms, skeins of silk, even small machines are brought in procession to receive the blessing.

"Last year," he added, "we attended two such ceremonies on our last trip, one held at a monastery belonging to monks of the Benedictine Order."

### Doll Left by Queen Anne as a Girl

The castle's mellow red-brick front, erected by a former member of the family to please Queen Anne, conceals its original character. Behind lies a Tudor courtyard overlooked by mullioned windows.

Inside, the great hall gripped my attention. Old paintings decorated its oak-paneled walls. One portrayed a 16th-century head of the house with his two sons. It belonged to the school of Holbein and was dated 1575.

My eye fell next upon a doll seated in an old carved chair. Said the major, "We call her Anne. It was left behind by that Queen on one of her visits when a child."

The doll wore a pink satin dress of beautiful quality, as brilliant as the day it was dyed some 250 years ago.

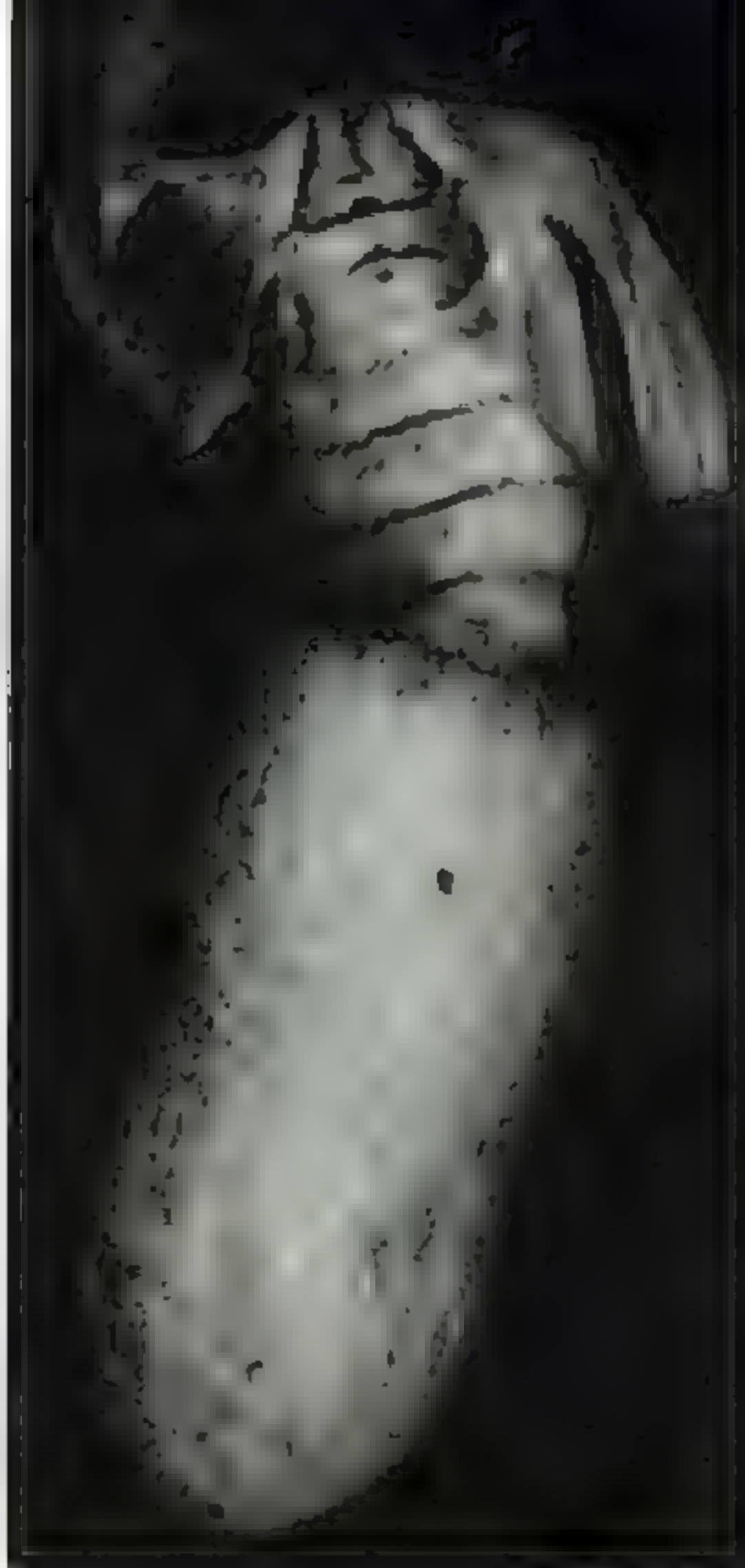
In an alcove hung a framed square of white silk. It was taken from the length of material made at Lullingstone for the wedding dress of Britain's young Queen, Elizabeth II. Designed from a painting by Botticelli, the dress had been embroidered with White Roses of York, stardewers, orange blossoms in pearl and crystal, and ears of corn.

The main staircase, the major informed me, had been built specially for Queen Anne, who was slightly lame and inclined to be plump. Broad, shallow treads enabled Her Majesty to use the stairs with dignity and without undue exertion.

At the top of this royal staircase I met a lady with very blue eyes and a determined-looking chin—Lady Hart Dyke (page 691). She greeted me with outstretched hand and a smile.

Just then the front doorbell rang, and the major left us to welcome a party of visitors.





### A Silk Moth Emerges and Lays Her Eggs

[illegible]

Wanted to know: The common law is still on 4 corners. That is, the common law is still the common law and the common law is still the common law.

» The first of four steps for making most of these changes the business has to be open to the possibility of change. It has to be able to recognize that change is coming and that the only way to survive is to change. Whether you are a small business owner or a large corporation, you must be open to change in the way you do business.







1066

THE NEW YORK PUBLIC LIBRARY

# ♣ The Larvae Crawl for Five Weeks Before Spinning Their Silken Strands

The silkworms (larvae) of the mulberry silkworm, *Bombyx mori*, are found in the larval stage about three weeks after hatching from the egg. They feed on mulberry leaves and other leaves of the mulberry tree. A silkworm will spin its cocoon in about five weeks after hatching. The cocoon is a silken case in which the larva hibernates until it is ready to emerge as a moth. The silkworms are raised in large numbers for the purpose of producing silk for the textile industry.





## Raw Silk Comes from Fluffy Silks

It is a fine Nature's process and more or less with the same in the manufacture of silk. The water reflects the light and gives it a soft, fluffy appearance, and for the same reason, the water gives it a soft, fluffy appearance.

It is a fine Nature's process and more or less with the same in the manufacture of silk. The water reflects the light and gives it a soft, fluffy appearance, and for the same reason, the water gives it a soft, fluffy appearance.

Most, however, the water is not so pure as the water in the sea, and for the same reason, the water gives it a soft, fluffy appearance, and for the same reason, the water gives it a soft, fluffy appearance.



## 40 Cocoons Make a Double Handful

Not only are the cocoons so small for the silkworm, but they are so small that they are not even noticed when they are first laid down. They are so small that they are not even noticed when they are first laid down.

They are so small that they are not even noticed when they are first laid down. They are so small that they are not even noticed when they are first laid down.

They are so small that they are not even noticed when they are first laid down. They are so small that they are not even noticed when they are first laid down.









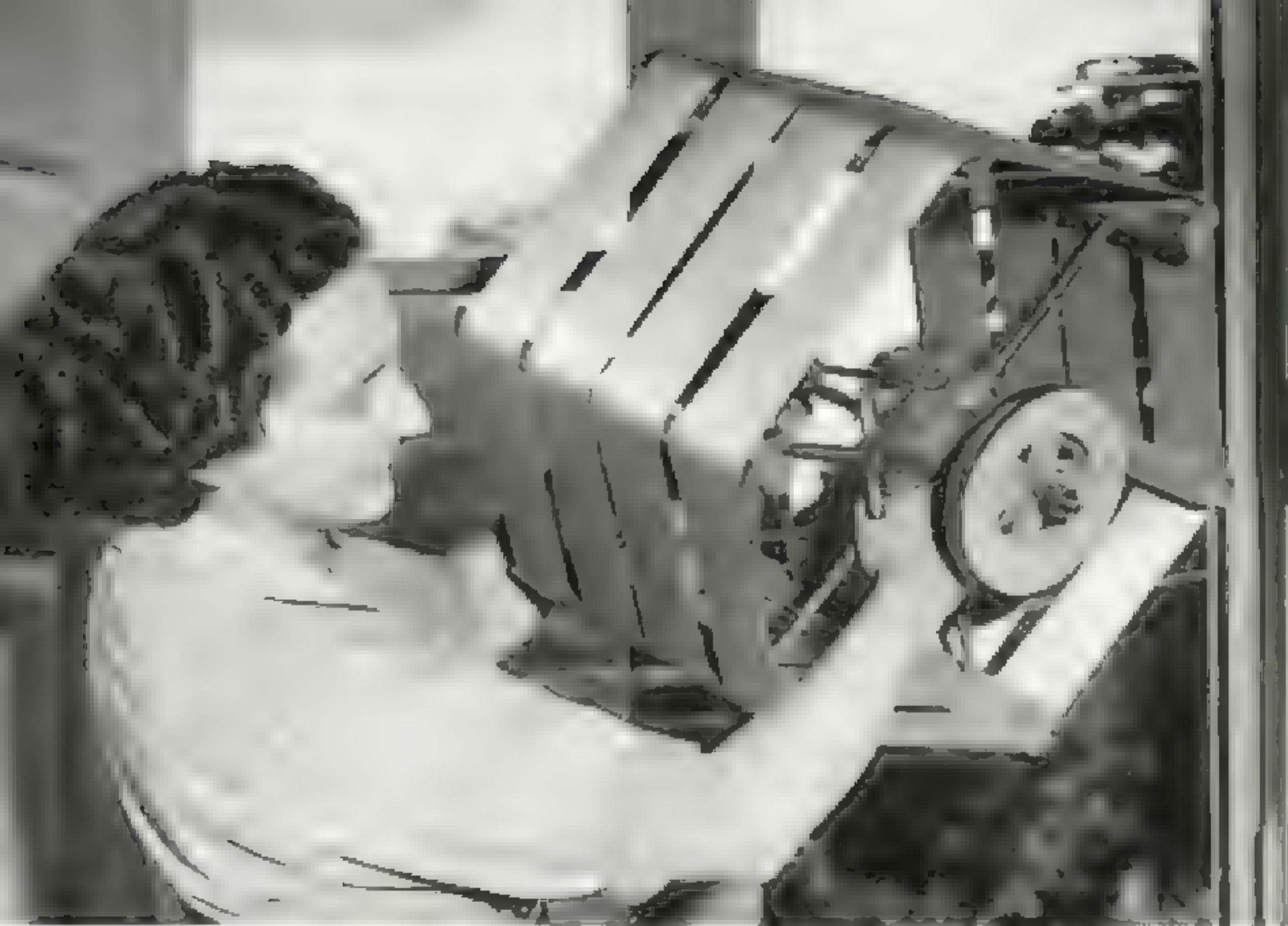
• **Article 1** provided for the  
formation of a  
new political party

[illegible]

The authors are grateful to the  
 National Science Foundation  
 for the support of this work.  
 The authors are also grateful to  
 the National Science Foundation  
 for the support of this work.  
 The authors are also grateful to  
 the National Science Foundation  
 for the support of this work.



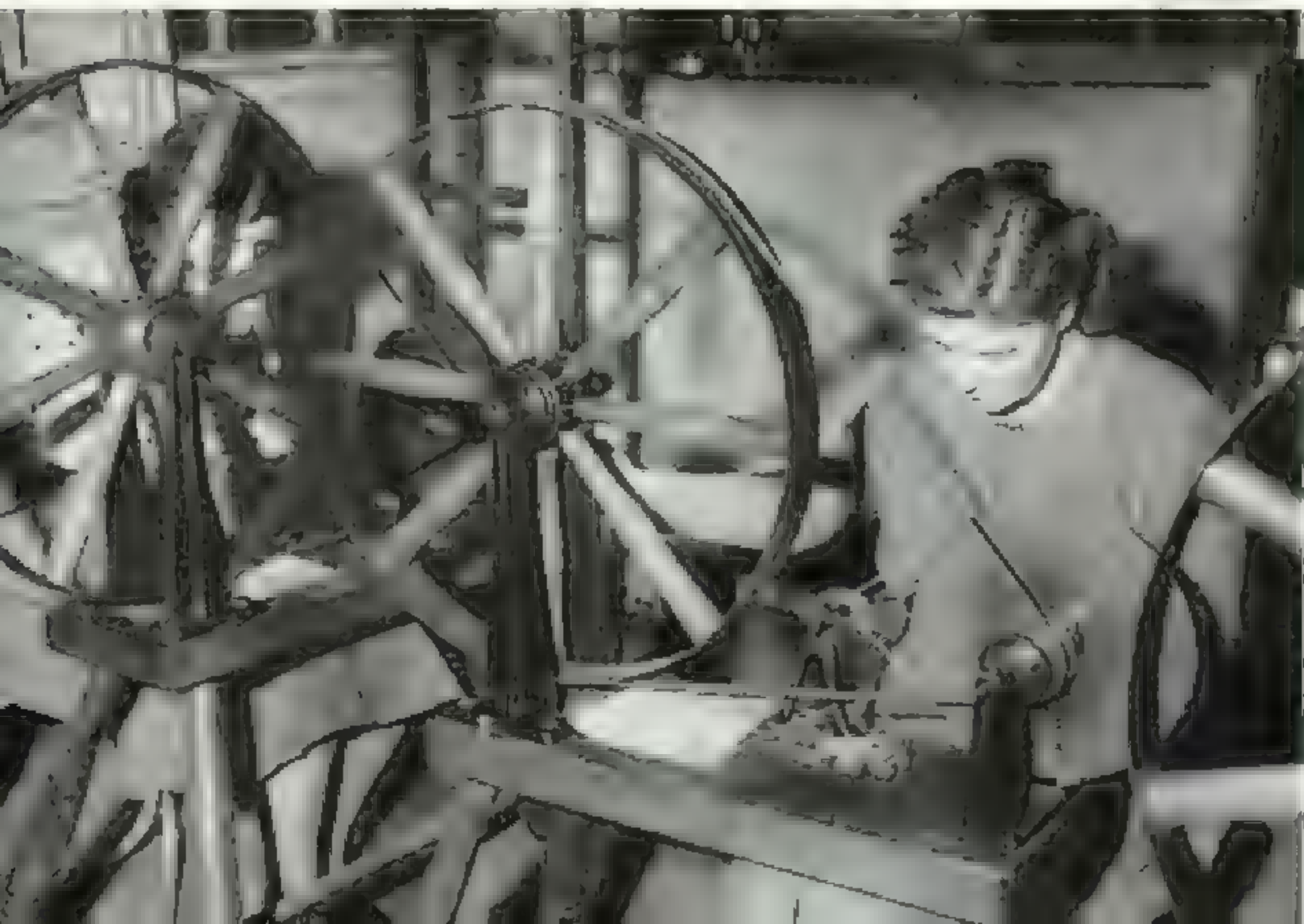




700

A Miss Skains Reaches Fullingstone's Testing Room, Where Raw Nib Is Inspected

A woman in a dark dress and white apron, identified as Miss Skains, is inspecting a man in a white shirt and dark tie, identified as Raw Nib. They are in a room with a large, striped, cylindrical object, possibly a barrel or a piece of machinery, in the background. The man is looking down at something in his hands, and the woman is looking at him. The room appears to be a testing room or a workshop.









"Always visitors," her Ladyship commented with a laugh. "Last year nearly 40,000 came to see the silk farm. They come by bus from all parts of Britain, and more than half are children."

"Come along," she added, "I'll show you the Tudor kitchen first."

#### Silkworm Eggs in Castle Kitchen

I expected to see a lot of old spits and copper pots and pans. Instead, I saw a number of wooden racks, with hundreds of small white cotton bags suspended from them.

Lady Hart Dyke explained that the entire silk farm was housed within the castle walls, except for greenhouses and nurseries containing some 30,000 small mulberry trees, and the kitchen was now the egg-laying room. Each little bag, she said, contained a female moth of the silkworm, placed there after mating.

After about four weeks, the bags are removed. This allows time for each moth to lay 300 to 450 eggs, after which she dies (page 695).

Dead moths are removed, and the eggs are stored in boxes in a cold, dry room till a time in spring when the mulberry leaves are the size of an English halfpenny. Then they are placed on muslin-covered trays and put into an incubator.

At Lullingstone the incubators are simple square wooden boxes on legs, lined with metal jackets for holding water. The water is heated by a small oil lamp set on a movable bracket underneath so that it can be raised or lowered according to the temperature required. Usually the eggs hatch in about seven days at 72°F.

The silkworms normally hatch in early morning. They break the egg by biting through the side of the shell.

On emerging, they are about one-twelfth of an inch long, dark, and covered with long hairs which disappear after the fourth day. Nature provides the hairs to protect worms against overcrowding or crushing by their fellows. Because of their size, color, activity, and sharp jaws they are called "ants" at this period of their lives.

To remove the worms from the incubator, pieces of finely perforated paper are placed over the trays, and strips of mulberry leaf are laid on top. Attracted by the smell of the leaf, the worms wriggle through the holes, which prevent empty shells or unhatched eggs from being dragged along by the thin filament of thread exuded by the newly hatched worm.

When all the mulberry strips are covered with worms, they are placed upon large trays and taken to the rearing rooms (page 694).

On our way there along an oak-paneled

corridor hung with antique pistols and blunderbusses, we met the major again, surrounded by a party of excited children. Many carried cardboard boxes.

"They are full of cocoons," her Ladyship explained. "Thousands of children are sending their home-produced cocoons to be turned into silk for the Queen's coronation robe."

In a rearing room a vast sea of silkworms crawled over long trays set up in tiers. The scent of fresh mulberry leaves filled the room.

#### Busy Chewing Sounds Like Rain

At first I was puzzled by a curious sound, somewhat like that of falling rain. It was the sound of the silkworms' busy jaws cutting into dry leaves. The leaves must be dry, for dampness causes various ills of the domesticated silkworm.

The worms are fed five times a day. For the first ten days the mulberry leaves are cut into small pieces; then larger ones are provided until finally the worms receive whole leaves (page 696).

"How long do they live, and how much do they eat?" I asked.

"Not very long—only 35 to 40 days," said my guide, "but in that time each worm consumes about three-fourths of an ounce of mulberry leaf."

Along with this heavy intake of food goes rapid growth. On the sixth day after hatching, the loosely fitting skin falls out, but since the skin does not grow with the rest of the body Nature steps in and causes the creature to molt, or cast its skin.

This process occurs four times before the worm is ready to make its cocoon.\*

Lady Hart Dyke pointed to a worm that was molting. With almost acrobatic contortions, it drew itself farther out of its old envelope.

The silkworm, I learned, has an odd way of breathing. Unlike most creatures, it does not breathe through its nose or mouth but through nine oval holes along its sides.

#### Each Worm Spins 1½ Miles of Silk

In a room next door these strange insects were in a more advanced stage. From three to four inches in length, their almost transparent bodies were greenish gold. Beside their trays were neat, test-shaped bundles of straw.

Having molted the fourth time, the worms had finished their growth. Their tiny reservoirs were full of liquid silk, and the time to make their cocoons had come.

I watched a worm which had started to spin

\* See "Strange Habits of Familiar Moths and Butterflies," by William Joseph Showalter, *National Geographic Magazine*, July 1927.





### Peers and Peeresses Carry Coronets and Wear Crimson Velvet Trimmed with White Fur

Tailors and dress-makers worked for a week preparing robes for the peerage at prices ranging from \$3,500 for the robes and coronets to \$5,000 for the robes and coronets. These robes are made of crimson velvet trimmed with white fur. The robes are made of crimson velvet trimmed with white fur. The robes are made of crimson velvet trimmed with white fur. The robes are made of crimson velvet trimmed with white fur.



its cocoon. Its body emitted a thick viscous solution which solidified into a thread of silk as it came into contact with the air. Equipped with two sacs, the worm soon emitted a second thread. Covered with a natural gum, the two threads adhered, resulting in a single thread of greater strength.

My worm had suspended its "hammock," or safety net, between two straws and I was now wrapping silk around itself in the form of figure eights (page 696). While I was engrossed in this remarkable exhibition I was reminded by the major that I should have to wait three days for the cocoon to be completed.

"In that time," he said, "the worms will have moved its head back and forth some 300,000 times and spun about a mile and a half of silk."

Cocoons are plucked from the straw tents in the manner of cotton being picked. Then all except those set aside for reproducing the next season's moths are placed in sacks and taken to the stifling ovens.

#### Emerging Moth Would Ruin Silk

Were it not for the stifling process, the adult moth would emerge from the cocoon as a moth and spoil the silk.

Unlike the worm, which bites through the egg to free itself, the moth has no jaws with which to bite its way out of the cocoon. Instead, from two glands in the head, it pours a drop of alkaline fluid upon one end of its silken prison (page 695).

This fluid has a solvent effect, not upon the silk itself but upon the natural gum with which the silk is covered; its action causes the threads to loosen so that they can be pushed aside by the moth. But if the moth were left alive to escape its silken cell, the fluid would leave an indelible stain on the silk.

Cocoons can be stifled by gas or steam, or by dry heat, the method used at Lullingstone.

"Our methods may be primitive, but they are adequate," Lady Hart Dyke remarked. "We leave the cocoons for about an hour, at a temperature of between 168° and 174° F. That is sufficient to kill the pupae before they form into moths and yet not damage the silk."

Her ladyship demonstrated how the rough silk, or fluss, is stripped from the outside of the cocoons. Taking a handful of cocoons, she placed them in a hopper above a long, sloping tray fitted with three rough-sided, revolving metal rods. As the cocoons slid down the incline they were caught by the rods and freed of fluss by the time they reached the bottom.

After being sorted for size and quality, the cocoons are taken to a vermin-proof store-room until the reelers are ready to unwind the silk.

The reeling shop, a large steam-filled room, was once the castle's laundry. At work here were six girls, two to each reeling machine. These machines are in two parts, the cocoon basin and the actual reeling apparatus (pages 698 and 699).

Suspended in each basin, full of boiling water, was a metal colander held fast by clips. Some 30 cocoons were placed in this receptacle under a revolving brush. Set in motion the brush swept the now softened cocoons round and round. After about 35 revolutions it was lifted, and there, clinging to its stiff bristles, I saw a number of silk threads.

#### Thickness Is Important

The girl jigged these silken strands gently up and down in the water until the cocoons began to unwind, then she handed them to the girl opposite. This operator fed the ends of the threads into revolving disks which carried them up to a series of pulleys and so onto large revolving spindles.

The silk then being reeled was for the lining of the Queen's coronation robe, so extreme care was being taken to insure that the thickness of the thread remained standard.

This standard is known as the denier, or measurement of a thread's thickness. It is based on the weight for a given length, which is obviously greater for a thicker thread. The name originated from an old French coin once used as a weight for weighing silk. A single cocoon thread is normally about three deniers.

From the reeling shop, with its rather sickly odor, we went to the testing room. Here the skeins from the reeling cabinets were being stretched, opened out, and searched for loose ends, thick threads, and bits of fluff.

At intervals tests were made of the skeins by measuring off 450 meters of thread and weighing it on a very delicate scale.

When this examination was completed, the skeins were laced, twice in white to keep them neat, and once in red to indicate the beginning and end of the thread. They were then twisted, like skeins of wool, and parceled into "books" ready for dispatch to the weavers.

#### Industry Grew from Childhood Hobby

Although I had seen almost everything in this home of royal silk and had listened with great attention to the absorbing story of the silkworm's life and work, I still had one question for her ladyship: "What made you keep silkworms?"

"That is a difficult question," she replied with a smile. "I first became interested in these strange little creatures when I was four. I started silkworm rearing as a hobby—and this grew into the small industry you see today."



## Burr Prizes Awarded to Dr. Edgerton and Dr. Van Biesbroeck

705

FOR extraordinary contributions to science in cooperation with the National Geographic Society Dr. Hesselberg, subject matter and Dr. George Arthur Van Dine, in co-operation of The Society, establish the Rort Prize consisting of cash awards.

Dr. Edgerton, professor of electrical engineering at the Massachusetts Institute of Technology, will present a paper on the latest flashlight for ultra-high-speed photography. Dr. Van Biesbroeck, of Yerkes Observatory, who is professor emeritus of astronomy at the University of Chicago, will discuss the starlight is bent by the sun's gravity, as predicted by Albert Einstein in accordance with his theory of relativity.

The Frank M. L. Burr Prize was established under the bequest of the late Mary C. Burr, Hartford, Connecticut, who bequeathed a fund to the National Geographic Society in memory of her father. Miss Burr's will directed that the income be used in the awarding of cash prizes to three authors or National Geographic Society employees who, in her opinion, had done the best or most meritorious work in the field of geographic science.

For Edgerton developed high-  
tensile flash as briefly as a mil-  
lionth of a second. They have  
not a parallel for power  
density to produce such a hot  
plasma over 1,000 miles a  
second, he said. "I am con-  
vinced that this is the first  
time we have produced a plasma  
in a laboratory," he said.

These rights now hold a variety of material and scientific uses. And these cameras shut for speeds become relatively instantaneous, for the camera can photograph a single pinster.

## Hidgerton Flush Stops a Bird in Flight

Robert J. Anderson is the electronic engineering department head at the University of California at San Diego. The inventor of the laser, he is coauthor of a book, *Amplified Spontaneous Emission in Lasers*, in California. He is also a member of the American Physical Society, the American Nuclear Society, and the American Association of Physics Teachers.

**MAYOR**—I received the information from the Chief of Police that you are looking for a new place to live. I have a few suggestions for you. Why don't you try the apartment house at 200 West Madison Street? It's a nice place, and it's close to the city center. You'll like it.

sufficiently to impress its image upon the film only during the almost instantaneous in-

William Stephenson, editor of the NATIONAL GEOGRAPHIC MAGAZINE of 1911, is the son of a blind man who was blind 55 times a second owe their existence to Dr. Edger's genius. The inventor made some of the pictures of the blind men as people who were blind men, and a picture of a blind man.

On January 12, at a luncheon held in honor at The Society's headquarters. Walter Huxley, Jr., Dr. Edgerton was presented with a check for \$2,000. Malin, the president of the National Geographic Society and Editor of its magazine, remarked that The Society has been particularly aided in its mission of increasing and diffusing our geographic knowledge through the use of equipment designed by Dr. Edgerton for the specific needs of its staff photographers.

The Society has been very successful in its work, and has been able to secure a number of grants from the Government,' said Dr. Grosvenor. 'It has helped us achieve results of great value.'







79

### Dr. Van Biesbroeck on Sudan's Sands Prepares to Shoot an Eclipse

FOR THE FIRST TIME SINCE 1874, a total eclipse of the sun will be visible in the desert sands of the Sudan. Dr. Van Biesbroeck, of the University of Wisconsin, is preparing to observe the phenomenon from the Sudanese desert.

Dr. Edgerton never has permitted the National Geographic Society to pay him personally for his work. Now, through this award, deserved and made possible by the distinguished hour fairly, the Society can repay part of its own indebtedness to him while expressing the gratitude of the entire world of geographic science.

"Whenever one starts anything new," Dr. Edgerton said in reply, "it is usually a lone time before anyone appreciates or uses it. But almost immediately, in my case, there came replies from the National Geographic Society, followed by encouragement and practical tests of the equipment."

"The interest of the Society and its photographic reports are of inestimable value."

Trustees of The Society present at the luncheon, besides Dr. Grosvenor, were Dr. Lyman J. Briggs, Franklin L. Fisher, Dr. Robert V. Fleming, Dr. Alexander Wetmore, Dr. Hugh I. Davidson, Dr. William E. Whetter, Melville Bell Grosvenor, Rear Admiral L. O. Colbert, U. S. Coast and Geodetic Survey, Ret., Vice Admiral S. D. Lee, U. S. Navy, Ret., and Dr. Thomas W. McKee.

Also present were members of the Society's photographic staff who have worked closely with Dr. Edgerton. Edwin L. Wethered, chief of the photographic laboratory, especially realized the worth of Dr. Edgerton's flash equipment. Using it, he made pictures of things around that showed clearly for the first time how the roosting animals achieve their soaring flight.

Dr. Edgerton is a native of Fremont, Nebraska. Two years after his graduation from the University of Nebraska in 1925 as a Bachelor of Science, he earned a Master of Science degree from the Massachusetts Institute of Technology, later a Doctorate of Science.

### Dr. Van Biesbroeck Confirms Einstein

Dr. Van Biesbroeck received his award, \$1,000, at his home in Williams Bay, Wisconsin. The distinguished astronomer, in cooperation with the United States Navy and Air Force in 1952 led a National Geographic Society expedition to Khartoum in the Sudan, where he photographed the star field around the sun during its total eclipse of January 25.

He returned to Khartoum in August and with the telescope standing in exactly the same position photographed the same stars in the same relative position at night. By comparing the two sets of pictures, he measured accurately the displacement of the star images caused by bending of their light as it passed the sun.

About 90 years before, Dr. Einstein had calculated that the shift would be .75 seconds of arc—a tiny fraction of one degree of arc. The amount of displacement observed by Dr. Van Biesbroeck was between .140 and 2.00, with an average of 1.50 seconds of arc.

Born in Gent, Belgium, Dr. Van Biesbroeck studied astronomy and in his native country, as in Germany. He came to the United States in 1915 as a visiting professor and became an American citizen in 1922. His association with the University of Chicago, where he was acting professor of astronomy from 1924 until 1945, lasted until 1947.

\*See "First Eclipse Since 1874" by Frank P. Waters, National Geographic Magazine, May 1957.

Photograph by Dr. Van Biesbroeck, National Geographic Magazine, February, 1957.









## Glad to Have You Aboard

The first part of the document is a letter from the  
 Secretary of the State to the President, dated  
 January 1, 1865. The letter is signed by  
 William H. Seward, Secretary of State.  
 The second part of the document is a letter from  
 the President to the Secretary of State, dated  
 January 1, 1865. The letter is signed by  
 Abraham Lincoln, President.  
 The third part of the document is a letter from  
 the Secretary of State to the President, dated  
 January 1, 1865. The letter is signed by  
 William H. Seward, Secretary of State.  
 The fourth part of the document is a letter from  
 the President to the Secretary of State, dated  
 January 1, 1865. The letter is signed by  
 Abraham Lincoln, President.  
 The fifth part of the document is a letter from  
 the Secretary of State to the President, dated  
 January 1, 1865. The letter is signed by  
 William H. Seward, Secretary of State.  
 The sixth part of the document is a letter from  
 the President to the Secretary of State, dated  
 January 1, 1865. The letter is signed by  
 Abraham Lincoln, President.  
 The seventh part of the document is a letter from  
 the Secretary of State to the President, dated  
 January 1, 1865. The letter is signed by  
 William H. Seward, Secretary of State.  
 The eighth part of the document is a letter from  
 the President to the Secretary of State, dated  
 January 1, 1865. The letter is signed by  
 Abraham Lincoln, President.  
 The ninth part of the document is a letter from  
 the Secretary of State to the President, dated  
 January 1, 1865. The letter is signed by  
 William H. Seward, Secretary of State.  
 The tenth part of the document is a letter from  
 the President to the Secretary of State, dated  
 January 1, 1865. The letter is signed by  
 Abraham Lincoln, President.

The new Power Adapter for the 2007 Mac mini is a compact, sleek design that fits perfectly in your Mac mini. It's the perfect size for your desk, and it's the perfect size for your wallet. The new Power Adapter is the perfect size for your desk, and it's the perfect size for your wallet.

THE LUNING SALES FROM SAN FRANCISCO AND LOS ANGELES ALTERNATIVELY



The **main class** is **Student**  
 The **main method** is **main**  
 The **main class** is **Student**

TERNATIvely *Lines*



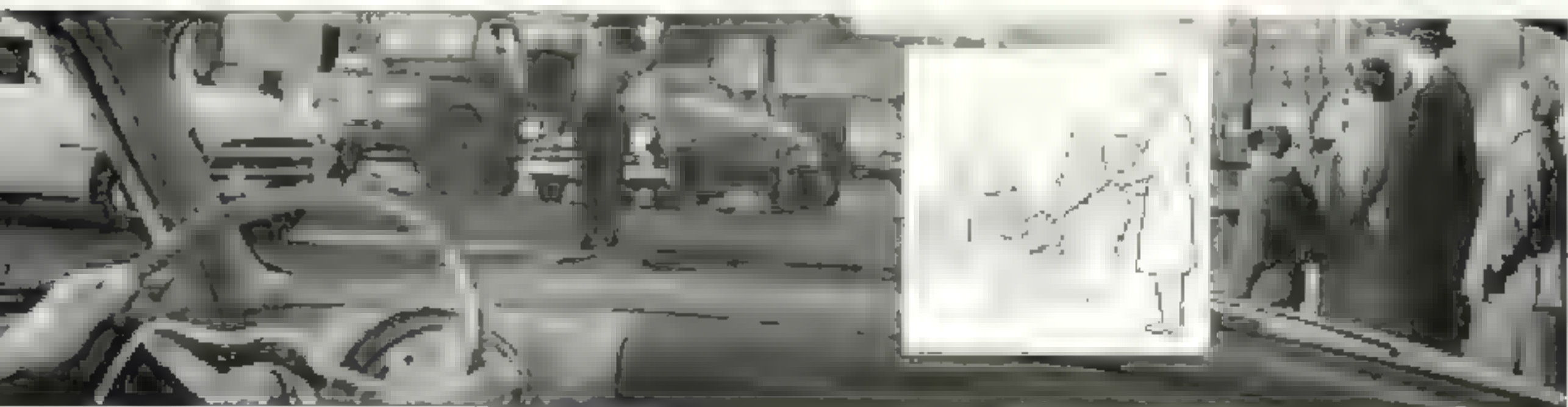
# EASIEST TO DRIVE AND THIS IS WHY

*There are engineering reasons for every benefit  
your new Chrysler Corporation car offers you*



**SITTING IS A NEW EXPERIENCE** In the 1963 Plymouth, Dodge, DeSoto and Chrysler. Here you ride comfortably relaxed, not all hunched up. The car rises and falls so that you can wear your good hat flat without ducking!

**THERE ARE REASONS.** For the past 40 years, Chrysler Corporation engineers and research departments developed a new way to "spring" your car that makes your ride smoother, more balanced than was possible before. The sports car ride is still there, too. Your spring area has been increased as much as 15%, too.



**EASY DOES IT.** At a modest extra cost, you can have a car that drives even more easily for you than without. Available on Chrysler and DeSoto is Easy Power Steering. Makes turning your car easy as dialing a phone.

**THERE ARE REASONS.** Car Engineers know that part of the job of the car is to develop and control the car's speed. The popular Chrysler Formula has been reduced by 15% and makes a difference in fuel economy. And another Chrysler feature, Power Brake, uses more power to make braking easier and quicker for you, too.

*Back of every development that makes your Chrysler Corporation car so easy to drive*

*are the talent and experience of engineers, scientists and technicians with the one aim—*

*to produce the most advanced car in the world.* **CHRYSLER CORPORATION**

*Chrysler Corporation, Chrysler Building, New York 17, N.Y.* Plymouth, Dodge, DeSoto, Chrysler Cars & Dodge Trucks

Chrysler Motors & Industrial Engineers • Dodge Metal Powder Products

Major Parts & Accessories • Accessories • Chrysler Financial Corporation • Chrysler Insurance Company



# NEW YORK STATE SIGNPOSTS



More than 100 scenic spots are featured in the Department of Commerce's new series of "New York State Signposts." The series is available in a variety of languages and is a valuable resource for tourists and residents alike.



**Hudson-Treasury Region**  
The Hudson River and the city of New York.



**Finger Lakes Region**  
The Finger Lakes and the surrounding area.



**Adirondack Park**  
The Adirondack Park and the surrounding area.



**Capital Region**  
The Capital Region and the surrounding area.



**Catskill Region**  
The Catskill Region and the surrounding area.



**Central New York Region**  
The Central New York Region and the surrounding area.

**FREE BROCHURE** "New York State Signposts" is available from the Department of Commerce, New York State Office of Tourism, Albany, New York.



New York State Department of Commerce  
Office of Tourism, New York State Office

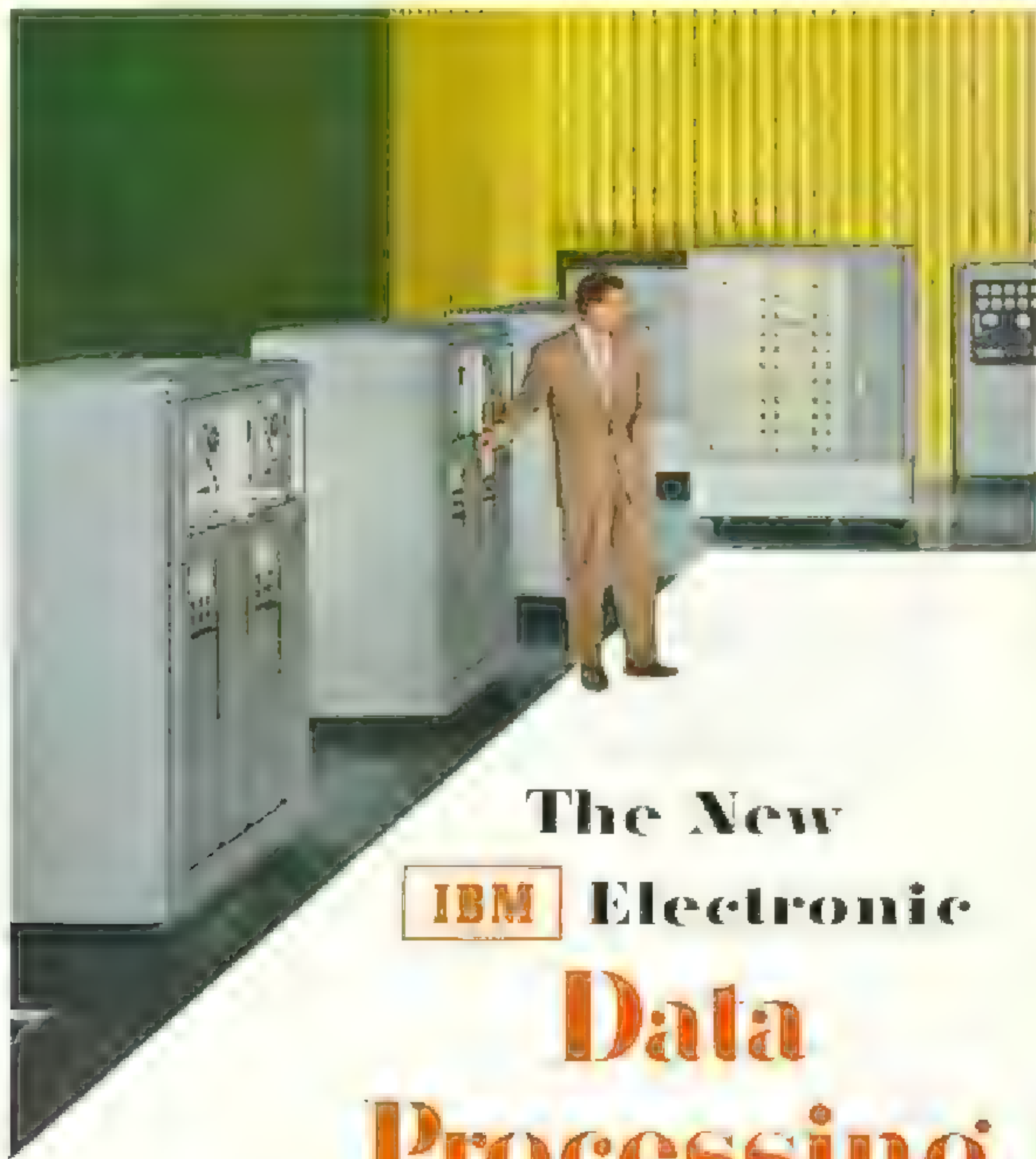
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Send me \_\_\_\_\_  
\_\_\_\_\_

More people find more to see and do in  
**New York State**  
*The Vacation Empire*





**The New**  
**IBM Electronic**  
**Data**  
**Processing**  
**Machines**

*For Science*



*Industry... Defense*





Combining the great storage capacities and speeds of cathode ray tubes, magnetic drums, and magnetic tapes with the tremendous computing speeds of electronic tubes, IBM engineers and scientists have produced in these machines the most flexible and most productive calculating unit ever marketed.

Here is a computer that can add and subtract 16,666 times a second . . . that can multiply and divide 2,192 times a second . . . and can recall factors from storage, or "memory," in as little as 12 millionths of a second.

This momentous advance in electronic computing gives defense industries, for which this computer was especially designed, a tool of vast power and versatility. For peacetime uses, it will be applied to a wide variety of engineering, research, and scientific problems.

The new IBM Electronic Data Processing Machines are the forerunners of data processing machines for business, now under intensive development in IBM laboratories.

### 3 KINDS OF "MEMORY"

(1) Magnetic drums—any of 41,943 "bits" can be stored or recalled in an interval of 41.1000 of a second. (2) Cathode ray tubes—any of 10,243 "bits" can be stored or recalled in 12.1000,000 of a second. (3) Magnetic tapes—any of 2,000,000 "bits" can be stored on one tape or recalled in an interval of 17.5000 seconds.

\*2000,000 bits on a full 400 ft. tape.

**IBM**

INTERNATIONAL BUSINESS MACHINES  
360 Madison Avenue, New York 17, N. Y.



# it's fun

## to go to California on the San Francisco OVERLAND

**FASTEST** non-stop line between any two cities between Chicago and San Francisco. Direct Overland Route (C&NW, UP&NP). See the High Sierra by day.

**FINE FOOD** is an "Overland" specialty. And eat up in the cars while scenery slides by your window. Part of the fun of traveling. Meals are reasonably priced.

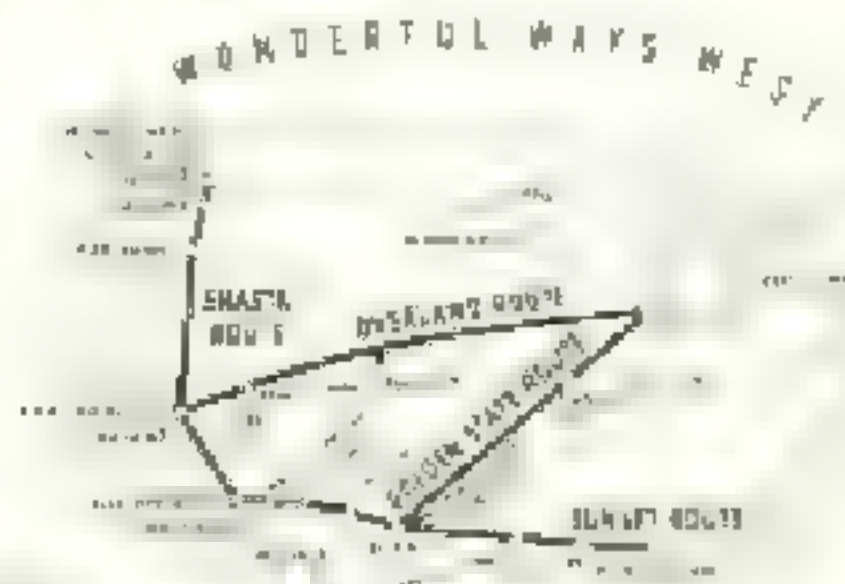


Stop over at 16 to 18 - fun or to try your luck



**YOU'LL FIND** only good traveling companions in the "Overland's" Pullman Hotel. Luxurious food and accommodations. Low cost reserved seat Chair Cars. Special Lounge for Chair Car passengers too. Spacious restrooms. Pillow service.

**HIGH SPOTS** of your "Overland" trip is arrival at San Francisco. Cross San Francisco Bay by trestle, over both famous bridges. Learning try another S.P. route and you'll never see the coast again. Send for folder that tells how.



# S·P

AMERICA'S MOST  
MODERN TRAINS

More on the National Geographic—It identifies you



Here's why it takes

80% less effort to *steer* this new DE SOTO and  
50% less effort to *stop* it!



Here's the new DeSoto sedan—80% less effort to steer.

**P**rimarily the first thing that you notice when you drive the new DeSoto is the ease with which it will steer. You'll find it takes 80% less effort to turn the wheel than it takes to turn the wheel of a car with a steering wheel that weighs 25 pounds. The DeSoto's new steering system gives you a new kind of steering.

It's called "steering without strain." Press a wheel and feel the car respond to the slightest touch. It's the DeSoto's new steering system—80% less effort to steer.

And when you get to the brakes, you'll notice a new kind of ease. The DeSoto's new brakes are 50% easier to stop.

And when you get to the engine, you'll notice a new kind of ease. The DeSoto's new engine is 50% easier to start. And when you get to the transmission, you'll notice a new kind of ease. The DeSoto's new transmission is 50% easier to shift.

Drive this new DeSoto soon! It's a new kind of ease. DeSoto Division, Chrysler Corporation, Detroit, Michigan.



Whether you have a car or not, you'll find it's the new DeSoto that's the easiest to drive. It's the new DeSoto that's the easiest to drive. It's the new DeSoto that's the easiest to drive. It's the new DeSoto that's the easiest to drive.



There's

# One Sure Way

to enjoy Spring travel at its best...



One Sure Way to take it easy: Relax on your ride behind one of America's finest drivers.



One Sure Way to plan smooth trips: Let Greyhound's friendly agents do the planning.



One Sure Way to meet America—Take a Greyhound Experience-Paid Vacation Tour!

## Go Greyhound!

You can plan with confidence when you use Greyhound for Spring trips, on business or pleasure, to any part of America.

You know you're getting the best for the money when you travel Greyhound. You can plan your trip with confidence, knowing that Greyhound's friendly agents will help you plan your trip. And you can be sure that your trip will be smooth and comfortable. And you can be sure that your trip will be a Greyhound Experience.



### FREE! Full-color pleasure map

Map available at Greyhound Information Center, 71 W. Lake St., Chicago 1, Ill. or at the nearest Greyhound bus station. Also available at the Greyhound Travel Agency.

NAME

ADDRESS

CITY

STATE

PS 8-81







# A quick tour...to a land of new profits

One of the Profits lands of your business future is the Land of Glass.

During the next few months, you will be planning for 1951. Perhaps you'll be thinking about premiums, or about accessories, or about new products.

We would like to plan *with* you, as we have done with hundreds of other forward-looking manufacturers.

For example, we might discuss how premiums of heat-resistant Pyrex brand glasses can help you sell more goods; or how—if you make kitchen appliances—attractive Pyrex bowls, dishes or refrigerator sets might raise your competitive position; or how you might use low-cost Pyrex brand glasses instead of other high-cost materials and save money while boosting sales. Pyrex ware is so popular with American women that 90% use it now and always want more!

A quick tour of the pictures at the right and of our descriptive brochure about glass in industry—free of cost or obligation—will offer more excitement than a trip to Ball's Bling. May we hear from you before your plans have jelled?



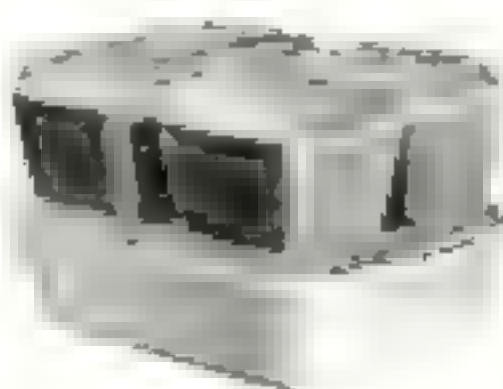
Beverage Server



Household Vacuum Cleaner



Pyrex Colored Casserole with Cover



Pyrex Refrigerator Set



Chemex Coffee Maker

## Corning Glass Works

CORNING, NEW YORK



*Cooking means research in Glass*



CORNING GLASS WORKS, 155 Crystal St., Corning, N. Y.  
Please send me a copy of your new brochure, "Glass and You."

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

\* PYREX is a registered trade mark of Corning Glass Works in the United States

Mention the Name of this magazine. It identifies you.







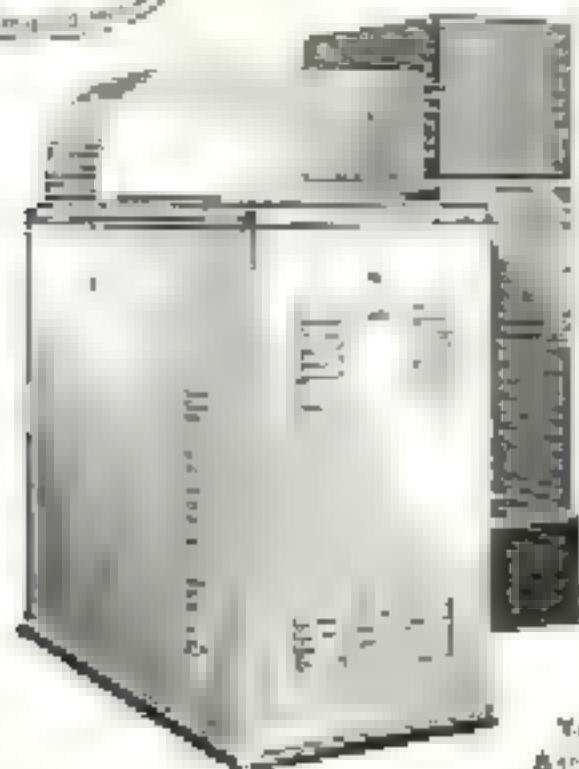
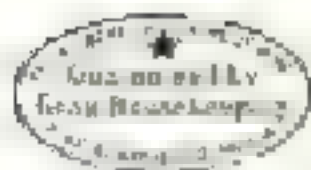


*is for Kitten*

so playful and gay,  
with Chrysler Airtemp . . .  
the weather's like May!



Room Air Conditioner  
Fits in window, 200-1  
Power window plug included



Year-Round  
Air Conditioner  
Heats, cools, filters,  
dehumidifies

May weather inside your home all year 'round has many advantages. Every room in your home stays cleaner, longer . . . needs less housework . . . when you have Chrysler Airtemp Year 'Round Air Conditioning. Your drapes and furniture stay new looking—retain their beauty for years.

Your family will be healthier, more comfortable, too. In the hottest part of summer or in winter cold, you and your family can live in a *Springtime* climate tailored to YOUR wishes.

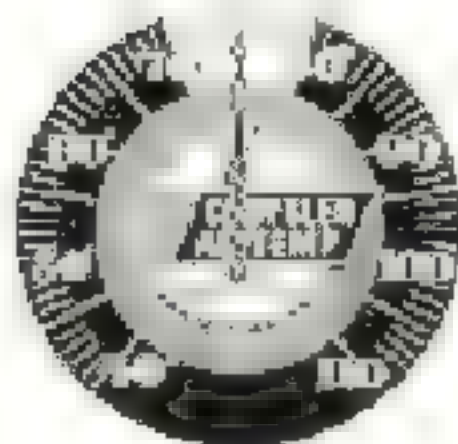
*Chrysler Airtemp*

HEATING • AIR CONDITIONING

for HOMES, BUSINESS, INDUSTRY

Airtemp Division, Chrysler Corporation, Dayton 1, Ohio

*Comfort Zone*



Get a free copy of the delightful Alphabet Book for children. It shows many benefits of Chrysler Airtemp Air Conditioning for you and your family.

Airtemp Division, Chrysler Corporation  
P. O. Box 1637, Dayton 1, Ohio

811-6-11

I want to know more about the Chrysler Airtemp Comfort Zone  
and for my free copy of the Chrysler Airtemp Alphabet Book

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_

See the National Geographic. It tells us you







# Star of the silky way



This one has to be good. It's called the Very Rare Roadmaster.

So up to us, ladies and gentlemen, along and there go with you drive. You will soon know how good a drive you're getting.

You'll know it's there with its spring power to make it's V-8 engine the world's newest and most advanced V-8.

You'll know it's there with its power— with wind-up Overhead valves. The swifter your acceleration to infinite velocities.

You'll know it's there in the velvety luxury of its best ride ride in the new class of its handling, in the most relaxing place for you in the more precise

control it gives you with its Power Steering its automatic emergency and power brakes to lighten the task of parking, steering.

It's called Roadmaster.

It is for you the best car in the world— the great and glorious going of the soft foot, the smoothest, the silkiest, the most steady car you've ever seen. A Buick Roadmaster.

Your Buick dealer will be very happy to introduce you to it. Why not drop in on him soon?

BUICK Division of GENERAL MOTORS  
Baltimore, Maryland

WHEN BETTER AUTOMOBILES ARE BUILT BUICK WILL BUILD THEM

*Custom Built* **ROADMASTER** *by Buick*





"I've waited a whole year for this!"

2. *How can you tell if a book is worth reading?* We've seen how  
 many ways there are to choose books. But how can you tell if a book  
 is worth reading? Here are some things to look for. First, the  
 author's name. If you know the author, you may know more about  
 the book. Second, the title. If the title is interesting, you may want  
 to read it. Third, the cover. If the cover is attractive, you may want  
 to read it. Fourth, the reviews. If other people have read the book  
 and liked it, you may want to read it. Fifth, the length. If the book  
 is too long, you may not have time to read it. Sixth, the price.  
 If the book is too expensive, you may not want to buy it. Seventh,  
 the subject. If the subject is not interesting to you, you may not  
 want to read it. Eighth, the format. If the book is in a format  
 you don't like, you may not want to read it. Ninth, the publisher.  
 If the publisher is well-known, you may want to read the book.  
 Tenth, the year it was published. If the book is old, you may  
 want to read it. Eleventh, the number of pages. If the book is  
 too thick, you may not want to read it. Twelfth, the language.  
 If the book is in a language you don't speak, you may not  
 want to read it. Thirteenth, the illustrations. If the book has  
 illustrations, you may want to read it. Fourteenth, the binding.  
 If the book is in good condition, you may want to read it.  
 Fifteenth, the reviews. If other people have read the book and  
 liked it, you may want to read it.

## Travel Item.

- We staffed reception centres at all border crossings to help you plan your trip
- Warm coats and hosiery
- Excellent shopping, with 120 boutiques and 60 shops

# ONTARIO

CANADA VACATIONS UNLIMITED

## Ontario Travel

41 C Parliament Bldg., Toronto 2 Ontario  
Phone area no five four two one and 0-4 zero  
one - last number at 0-4 zero

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

Symptoms: \_\_\_\_\_

$$C, y_1, \dots, y_{n-1}, y_n, S^{\text{out}}D \quad \dots$$


## 35mm Shooting is fun...



..but the  
real thrill  
is the show!

1997

*Extra Program* showing color slides

# La Belle

Automatic 35 mm. Slide Projectors



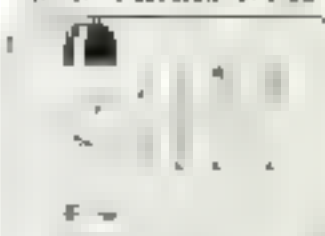
(4) 附錄 4-5-01

**\$9599\***

**American AUTOMATIC**  
**PRODUCES...**

[illegible]

NEW FINANCIAL CLERK  
IN THE PROSECUTION OFFICE



2000年12月15日 星期三



1950

For more information go to  
 a. [www.irs.gov](http://www.irs.gov)  
 b. [www.irs.gov](http://www.irs.gov)  
 c. [www.irs.gov](http://www.irs.gov)  
 d. [www.irs.gov](http://www.irs.gov)  
 e. [www.irs.gov](http://www.irs.gov)  
 f. [www.irs.gov](http://www.irs.gov)  
 g. [www.irs.gov](http://www.irs.gov)  
 h. [www.irs.gov](http://www.irs.gov)  
 i. [www.irs.gov](http://www.irs.gov)  
 j. [www.irs.gov](http://www.irs.gov)  
 k. [www.irs.gov](http://www.irs.gov)  
 l. [www.irs.gov](http://www.irs.gov)  
 m. [www.irs.gov](http://www.irs.gov)  
 n. [www.irs.gov](http://www.irs.gov)  
 o. [www.irs.gov](http://www.irs.gov)  
 p. [www.irs.gov](http://www.irs.gov)  
 q. [www.irs.gov](http://www.irs.gov)  
 r. [www.irs.gov](http://www.irs.gov)  
 s. [www.irs.gov](http://www.irs.gov)  
 t. [www.irs.gov](http://www.irs.gov)  
 u. [www.irs.gov](http://www.irs.gov)  
 v. [www.irs.gov](http://www.irs.gov)  
 w. [www.irs.gov](http://www.irs.gov)  
 x. [www.irs.gov](http://www.irs.gov)  
 y. [www.irs.gov](http://www.irs.gov)  
 z. [www.irs.gov](http://www.irs.gov)  
 aa. [www.irs.gov](http://www.irs.gov)  
 ab. [www.irs.gov](http://www.irs.gov)  
 ac. [www.irs.gov](http://www.irs.gov)  
 ad. [www.irs.gov](http://www.irs.gov)  
 ae. [www.irs.gov](http://www.irs.gov)  
 af. [www.irs.gov](http://www.irs.gov)  
 ag. [www.irs.gov](http://www.irs.gov)  
 ah. [www.irs.gov](http://www.irs.gov)  
 ai. [www.irs.gov](http://www.irs.gov)  
 aj. [www.irs.gov](http://www.irs.gov)  
 ak. [www.irs.gov](http://www.irs.gov)  
 al. [www.irs.gov](http://www.irs.gov)  
 am. [www.irs.gov](http://www.irs.gov)  
 an. [www.irs.gov](http://www.irs.gov)  
 ao. [www.irs.gov](http://www.irs.gov)  
 ap. [www.irs.gov](http://www.irs.gov)  
 aq. [www.irs.gov](http://www.irs.gov)  
 ar. [www.irs.gov](http://www.irs.gov)  
 as. [www.irs.gov](http://www.irs.gov)  
 at. [www.irs.gov](http://www.irs.gov)  
 au. [www.irs.gov](http://www.irs.gov)  
 av. [www.irs.gov](http://www.irs.gov)  
 aw. [www.irs.gov](http://www.irs.gov)  
 ax. [www.irs.gov](http://www.irs.gov)  
 ay. [www.irs.gov](http://www.irs.gov)  
 az. [www.irs.gov](http://www.irs.gov)  
 ba. [www.irs.gov](http://www.irs.gov)  
 bb. [www.irs.gov](http://www.irs.gov)  
 bc. [www.irs.gov](http://www.irs.gov)  
 bd. [www.irs.gov](http://www.irs.gov)  
 be. [www.irs.gov](http://www.irs.gov)  
 bf. [www.irs.gov](http://www.irs.gov)  
 bg. [www.irs.gov](http://www.irs.gov)  
 bh. [www.irs.gov](http://www.irs.gov)  
 bi. [www.irs.gov](http://www.irs.gov)  
 bj. [www.irs.gov](http://www.irs.gov)  
 bk. [www.irs.gov](http://www.irs.gov)  
 bl. [www.irs.gov](http://www.irs.gov)  
 bm. [www.irs.gov](http://www.irs.gov)  
 bn. [www.irs.gov](http://www.irs.gov)  
 bo. [www.irs.gov](http://www.irs.gov)  
 bp. [www.irs.gov](http://www.irs.gov)  
 bq. [www.irs.gov](http://www.irs.gov)  
 br. [www.irs.gov](http://www.irs.gov)  
 bs. [www.irs.gov](http://www.irs.gov)  
 bt. [www.irs.gov](http://www.irs.gov)  
 bu. [www.irs.gov](http://www.irs.gov)  
 bv. [www.irs.gov](http://www.irs.gov)  
 bw. [www.irs.gov](http://www.irs.gov)  
 bx. [www.irs.gov](http://www.irs.gov)  
 by. [www.irs.gov](http://www.irs.gov)  
 bz. [www.irs.gov](http://www.irs.gov)  
 ca. [www.irs.gov](http://www.irs.gov)  
 cb. [www.irs.gov](http://www.irs.gov)  
 cc. [www.irs.gov](http://www.irs.gov)  
 cd. [www.irs.gov](http://www.irs.gov)  
 ce. [www.irs.gov](http://www.irs.gov)  
 cf. [www.irs.gov](http://www.irs.gov)  
 cg. [www.irs.gov](http://www.irs.gov)  
 ch. [www.irs.gov](http://www.irs.gov)  
 ci. [www.irs.gov](http://www.irs.gov)  
 cj. [www.irs.gov](http://www.irs.gov)  
 ck. [www.irs.gov](http://www.irs.gov)  
 cl. [www.irs.gov](http://www.irs.gov)  
 cm. [www.irs.gov](http://www.irs.gov)  
 cn. [www.irs.gov](http://www.irs.gov)  
 co. [www.irs.gov](http://www.irs.gov)  
 cp. [www.irs.gov](http://www.irs.gov)  
 cq. [www.irs.gov](http://www.irs.gov)  
 cr. [www.irs.gov](http://www.irs.gov)  
 cs. [www.irs.gov](http://www.irs.gov)  
 ct. [www.irs.gov](http://www.irs.gov)  
 cu. [www.irs.gov](http://www.irs.gov)  
 cv. [www.irs.gov](http://www.irs.gov)  
 cw. [www.irs.gov](http://www.irs.gov)  
 cx. [www.irs.gov](http://www.irs.gov)  
 cy. [www.irs.gov](http://www.irs.gov)  
 cz. [www.irs.gov](http://www.irs.gov)  
 da. [www.irs.gov](http://www.irs.gov)  
 db. [www.irs.gov](http://www.irs.gov)  
 dc. [www.irs.gov](http://www.irs.gov)  
 dd. [www.irs.gov](http://www.irs.gov)  
 de. [www.irs.gov](http://www.irs.gov)  
 df. [www.irs.gov](http://www.irs.gov)  
 dg. [www.irs.gov](http://www.irs.gov)  
 dh. [www.irs.gov](http://www.irs.gov)  
 di. [www.irs.gov](http://www.irs.gov)  
 dj. [www.irs.gov](http://www.irs.gov)  
 dk. [www.irs.gov](http://www.irs.gov)  
 dl. [www.irs.gov](http://www.irs.gov)  
 dm. [www.irs.gov](http://www.irs.gov)  
 dn. [www.irs.gov](http://www.irs.gov)  
 do. [www.irs.gov](http://www.irs.gov)  
 dp. [www.irs.gov](http://www.irs.gov)  
 dq. [www.irs.gov](http://www.irs.gov)  
 dr. [www.irs.gov](http://www.irs.gov)  
 ds. [www.irs.gov](http://www.irs.gov)  
 dt. [www.irs.gov](http://www.irs.gov)  
 du. [www.irs.gov](http://www.irs.gov)  
 dv. [www.irs.gov](http://www.irs.gov)  
 dw. [www.irs.gov](http://www.irs.gov)  
 dx. [www.irs.gov](http://www.irs.gov)  
 dy. [www.irs.gov](http://www.irs.gov)  
 dz. [www.irs.gov](http://www.irs.gov)  
 ea. [www.irs.gov](http://www.irs.gov)  
 eb. [www.irs.gov](http://www.irs.gov)  
 ec. [www.irs.gov](http://www.irs.gov)  
 ed. [www.irs.gov](http://www.irs.gov)  
 ee. [www.irs.gov](http://www.irs.gov)  
 ef. [www.irs.gov](http://www.irs.gov)  
 eg. [www.irs.gov](http://www.irs.gov)  
 eh. [www.irs.gov](http://www.irs.gov)  
 ei. [www.irs.gov](http://www.irs.gov)  
 ej. [www.irs.gov](http://www.irs.gov)  
 ek. [www.irs.gov](http://www.irs.gov)  
 el. [www.irs.gov](http://www.irs.gov)  
 em. [www.irs.gov](http://www.irs.gov)  
 en. [www.irs.gov](http://www.irs.gov)  
 eo. [www.irs.gov](http://www.irs.gov)  
 ep. [www.irs.gov](http://www.irs.gov)  
 eq. [www.irs.gov](http://www.irs.gov)  
 er. [www.irs.gov](http://www.irs.gov)  
 es. [www.irs.gov](http://www.irs.gov)  
 et. [www.irs.gov](http://www.irs.gov)  
 eu. [www.irs.gov](http://www.irs.gov)  
 ev. [www.irs.gov](http://www.irs.gov)  
 ew. [www.irs.gov](http://www.irs.gov)  
 ex. [www.irs.gov](http://www.irs.gov)  
 ey. [www.irs.gov](http://www.irs.gov)  
 ez. [www.irs.gov](http://www.irs.gov)  
 fa. [www.irs.gov](http://www.irs.gov)  
 fb. [www.irs.gov](http://www.irs.gov)  
 fc. [www.irs.gov](http://www.irs.gov)  
 fd. [www.irs.gov](http://www.irs.gov)  
 fe. [www.irs.gov](http://www.irs.gov)  
 ff. [www.irs.gov](http://www.irs.gov)  
 fg. [www.irs.gov](http://www.irs.gov)  
 fh. [www.irs.gov](http://www.irs.gov)  
 fi. [www.irs.gov](http://www.irs.gov)  
 fj. [www.irs.gov](http://www.irs.gov)  
 fk. [www.irs.gov](http://www.irs.gov)  
 fl. [www.irs.gov](http://www.irs.gov)  
 fm. [www.irs.gov](http://www.irs.gov)  
 fn. [www.irs.gov](http://www.irs.gov)  
 fo.

81-5493\*

DOI: 10.1002/for

**La Belle industries, inc.**



IN CANADA—PRECISION CAMERAS, MONTREAL, QUEBEC

1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 26



# Choose your **WESTERN VACATION SPOT** here...

then go in style aboard NP's faster **NORTH COAST LIMITED**



## **ALASKA CRUISE**

Cruise the Inside Passage to Alaska past majestic icebergs, towering fjords, vast Esquimao villages, "gold mine" towns. From May to October, sea trips are available to Kotzebue, Iglood, Skagway, Sitka, Gulf of Alaska, Kodiak, Seward, Prince William Sound, Columbia Glacier, Valdez or Cordova. NP will arrange one-to-three-week cruises for you, take you west on either of our fine transcontinental trains, the North Coast Limited or the Mainstreeter. Round trip steamship fares begin at ... **\$160**



## **DUDE RANCHES**

Pick your own brand of western fun. Youngsters will like a real workin' ranch; you might prefer a rough-and-ready camp or a luxurious mountain lodge. NP has information on ranches in Montana, Wyoming, Washington and Oregon. We'll make your reservations, then speed you to meet your vacation at a cost station. In style you'll get your first taste of western hospitality—our famous dinner meets with the "Greatest Big Baked Potato." Weekly ranch rates, including meals, use of horses, from ... **\$60**



## **YELLOWSTONE PARK**

Bring your camera for snapshots of animals, geysers, spectacular scenery in America's world playground. On NP and choose from three Park entrances—thrilling Red Lodge Hot. Road, Paradise Valley and the Gardiner Gateway, and rugged Cody Road. Old Faithful Inn, Grand Canyon and Mammoth Hotels open June 22—Sept. 10 for tours of 2½ days or longer. NP offers shorter trips Spring and Fall. All-expense tours from Chicago to Yellowstone and return via the Mainstreeter, from ... **\$143**



## **PACIFIC NORTHWEST**

Take your choice of mountains or seashore. Relax, climb or hike at Glacier or Olympic National Parks, at Mt. St. Helens or Mt. Hood. Fish the famed Columbia for fighting salmon. Sail Puget Sound to San Juan Islands, Victoria or Vancouver, British Columbia. Stopovers and diverse routing privileges make it easy—and inexpensive—to include Spokane, Lake Pend Oreille, the Canadian Northwest or California on your tour. Round trip fares, Chicago to Seattle, Portland or Tacoma, as low as ... **\$82**



## **How to make the most of your vacation...**

Easiest way to arrange a vacation is by mail. Why not try it this summer? Just write us a letter, name the places you'd like to go. We'll plan a program for you, mail it promptly—with complete costs and schedules. If it suits you, order your reservations and tickets from us by mail. It's as simple as that.

You can stretch vacation time and money, too, when you travel NP. Low train fares actually cost you less than driving your own car. And Northern Pacific's new streamlined schedules save you extra hours for fun when you get where you're going.

Deluxe "Day-Nite" Coaches and private AL-room Pullmans let you choose accommodations to fit your family and finances. Two smart lounge cars afford extra pleasure for both Pullman and Coach passengers on the faster North Coast Limited.

For rates, schedules and more information about western vacations, see your local travel or ticket agent, or write ... G. W. Rodine, Passenger Traffic Mgr., Northern Pacific Railway, Dept. 762, St. Paul 1, Minn.



**NORTHERN PACIFIC RAILWAY** *Main Street of the Northwest*

Mention the National Geographic—It identifies you

















Every day's a great day for  
all the family...when you vacation

in **Michigan**

WATER WONDERLAND



#### Every Day is Father's Day

Don't choose any special time. You can fish for bass or trout along the 350 miles of Lake Michigan shoreline. Or you can go to the beach and enjoy the sun.



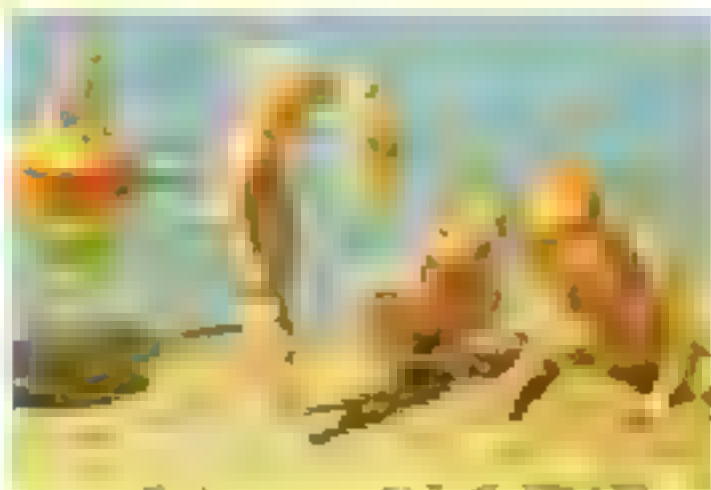
#### Every Day is Mother's Day

Wherever you find pleasures by the shore, you'll find pleasures by the shore. Always so relaxing, so beautiful, so near by.



#### Every Day is Teen-Agers Day

Michigan was made for you. There are no boring vacation spots. There are no boring vacation spots. There are no boring vacation spots.



#### Every Day is Youngsters Day

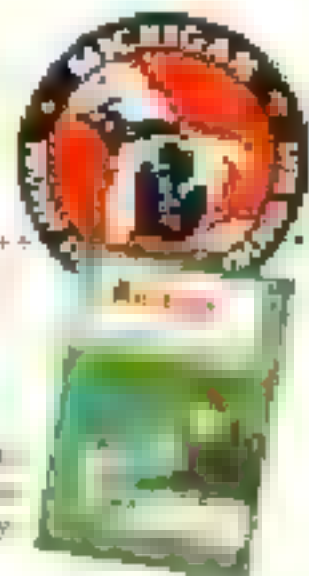
Michigan was made for you. There are no boring vacation spots. There are no boring vacation spots. There are no boring vacation spots.

From your first moment in Michigan, you'll know the distinctive charm that has made this nature blessed state the Nation's favorite family playground.

Each new hour offers opportunity for active sport or relaxation. Michigan's vacationland has complemented nature's beauty with golf courses, tennis courts, boat paths, and every other facility for round-the-clock pleasure. They're built and beautified public cabins and friendly hotels to serve as your comfort-combined headquarters.

Vacations are a Michigan specialty! You can have a kind of vacation wherever you go. This is the true Michigan Vacation. *There's no other like it.*

### MICHIGAN TOURIST COUNCIL



#### MICHIGAN TOURIST COUNCIL

Organized by  
Legislative Act

1000 Michigan  
Avenue, Detroit, Michigan

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

DATE \_\_\_\_\_

Send me a copy of the Michigan Tourist Council brochure.

- |   |   |
|---|---|
| <input type="checkbox"/> Free Michigan<br>Tourist Council<br>Brochure | <input type="checkbox"/> Super Package<br>Brochure - \$2.00 |
| <input type="checkbox"/> Michigan<br>Tourist Council<br>Brochure      | <input type="checkbox"/> Ward Michigan<br>Tourist Council   |





Bolex Stereo  
System  
#277-541  
and #277-542  
For my latest results  
choose the  
Bolex Stereo System  
#277-541  
and #277-542



## Today's MOVIES ...not yesterday's!

Today's fastest action ... at today's tempo ... with today's newest development ... Bolex Stereo Movies. Industry's leaders are already flocking to see the stirring new trend. Here is an opportunity to be in at the beginning.

It's the famous Bolex H-15 Deluxe movie camera with the exciting new Bolex Stereo System. The first completely integrated stereo movie camera ... a masterpiece of optical engineering by Henri Foclore.

See how utterly simple it is to switch from regular movies to Bolex Stereo movies ... in full color ... using your present Bolex projector ... and with no increase in operating costs!

Bolex features massive regular free mailings of the 25c magazine "Bolex Reporter" by registering serial numbers with us. There is also subscription \$2.00 per year.

Bolex Stereo System, 277-541 and 277-542, A. L. F. Co., 1111 Third Street, New York 10, N. Y.



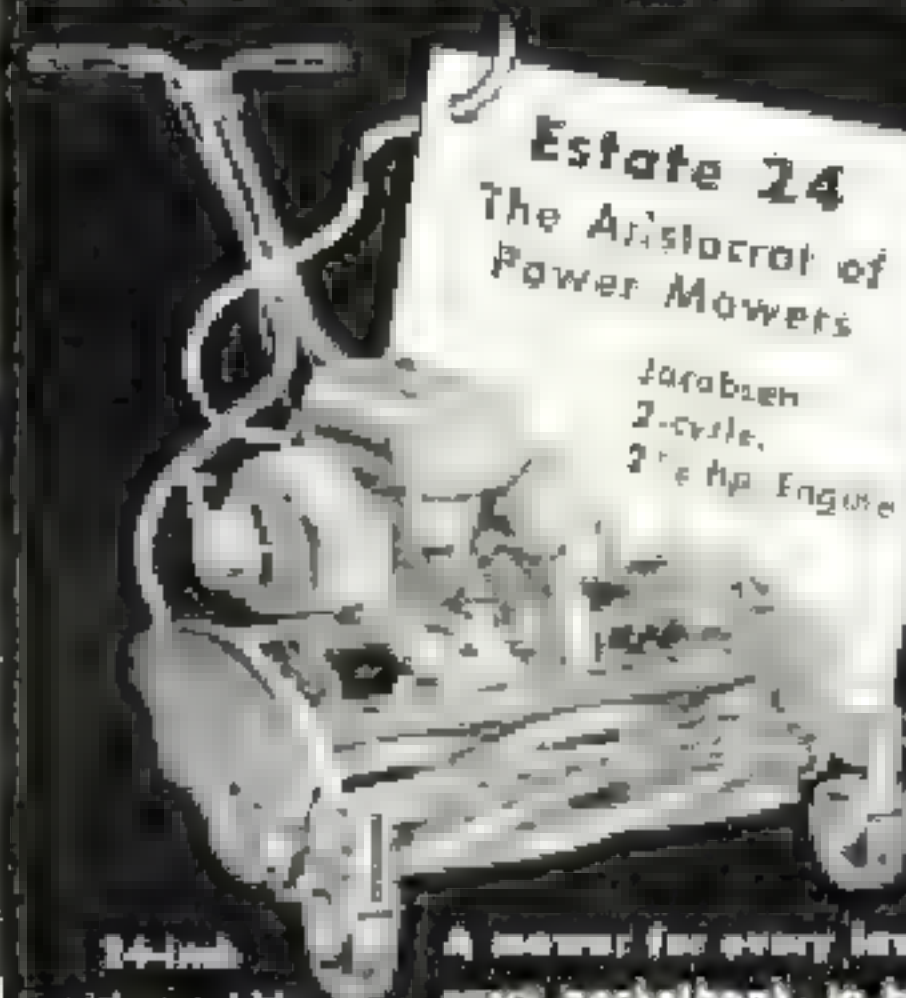
Be first...to enjoy 16mm home movie

# Bolex Stereo!

Bolex Stereo System, 277-541 and 277-542, A. L. F. Co., 1111 Third Street, New York 10, N. Y.

# Jacobsen

so much power for your money



Estate 24  
The Aristocrat of  
Power Mowers

Jacobsen  
2-cycle,  
2 1/2 hp Engine

34-inch  
cutting width

A mower for every lawn,  
every pocketbook, in both  
fuel-type and rotary models.

See your dealer or write for folder.  
JACOBSEN MANUFACTURING CO., Racine, Wis.

Here's top measure  
in cruise pleasure ...

## a Great Lakes Cruise

7 DAYS from \$129.50

from Buffalo, Cleveland,  
Detroit, Chicago or Duluth.

Over 2200 miles of exciting  
cruising! Shorter cruises  
available from \$35.00. Rates  
include transportation,  
meals, berth, OOT-  
SIDE cabin, entertain-  
ment, tax extra.

See Your  
Travel Agent  
or the  
Free Booklet  
enclosed  
coupon

GEORGIAN BAY LINE

1001 N. Main Street, Cleveland, Ohio 44114  
Phone: 521-1111 (Cleveland) or 521-1111 (Chicago)

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

GEORGIAN BAY LINE



Smart travelers use **HERTZ**  
to see more...do more...have much more FUN

by the same scheme on both the lowways as well as the highways

Discover a motor that are not in the usual "on order" words — see more do more, have much more fun — in a big new private car provided by Hertz. It's the practical, carefree way to travel because of the surprisingly low rental rates. In most Hertz cities you can enjoy 200 miles of completely free mileage each period of one week for as little as \$60.00 — or \$100 per period in some cities. Hertz is the only car rental company that gives you the freedom to use your car as you wish. Hertz Service way!



Ground Canyon Dam, site 727 m.      0° 12' N      96° 58' W      10,000 ft  
by all by most. SLD feed high 4.      0° 12' N      96° 58' W      10,000 ft  
Ground Canyon Dam, site 727 m.      0° 12' N      96° 58' W      10,000 ft

## RENT A NEW CAR FROM

# HERTZ

*...drive it as your own*

## HERTZ SERVICE: what it is, what it costs, how to get it . . .

**What It Is:** *Heart Is* is a rest-of-year year's "international" magazine distributed monthly. It features a mix of international and U.S. artists. The United States, Canada, Alaska, Hawaii, Cuba, Puerto Rico, Mexico and Switzerland.

**What It Costs** Here's a specific rate example: at the Hotel Madison, at 1400 Ave. DuRoi, the 24-hour, full-rate rate of \$29.95 plus tax and parking is \$34.95, including a continental breakfast. The total cost for a trip of 30 miles in any one day is only \$2.00, which is a maximum of four days. The \$2.00 fee is waived by the week. Rates are higher on different nights of the week.

**Gasoline, Oil, Insurance Furnished**—Even if you pay whatever amount you pay for additional gasoline and oil is furnished to you. Full-coverage Property Damage fire and theft insurance and \$10,000 deduction collision protection are included at the low rate—of no extra cost.

**How To Get It** Buy an away on A B-C to get from Home (A) and/or your telephone or radio or TV for your nearest Home station, (B) show your driver's license or ID of the station and identify yourself, (C) stop and a free new car and go.

**Advance Reservations** — To be sure of a car when you need it, call or write us now. Alternatively, you may make a reservation in advance. Any Herit station will make a reservation for

you or where, but not how. Or, if you have the correct Hertz  
information, you can find out if your desired vehicle is available  
your reservation by letter, telephone or in person. Also,  
any railroad or airline reservation office will make a Hertz  
reservation for you through the Hertz Rail-Auto Plan or the Hertz  
Plane Auto Plan at the time you purchase your railroad or airline  
ticket. Ask your railroad agent or Hertz when you make your reservation and  
be sure you will Hertz take care when you arrive at your destination.

**New Model Cars** Can be used from dealer as a days car or as a second car. The car of your own choice at Hertz Identification—It is your private car, for one hour, a day, or as long as you wish.

**Charge Cards Available.** Heitz Charge Cards interest business and pleasure travelers. As well as being accepted by most hotels, restaurants, and individuals, the card serves as identification, eliminates deposit requirements, and provides credit privileges if desired. Air Travel, Car rentals and Rail Travel Cardholders are awarded the same benefits extended to holders of Heitz Charge Cards.

**Additional Information:** For information on participating Metro stations — anywhere — or for information on any level of Metro Service operations, contact your nearest Metro station or — more or phone Metro Desk & the Customer and Information Unit 314 South Wabash Avenue, Chicago 4, Ill; phone: WEbster 7-5165.

Look in your telephone directory under "M" for your nearest Mark's station

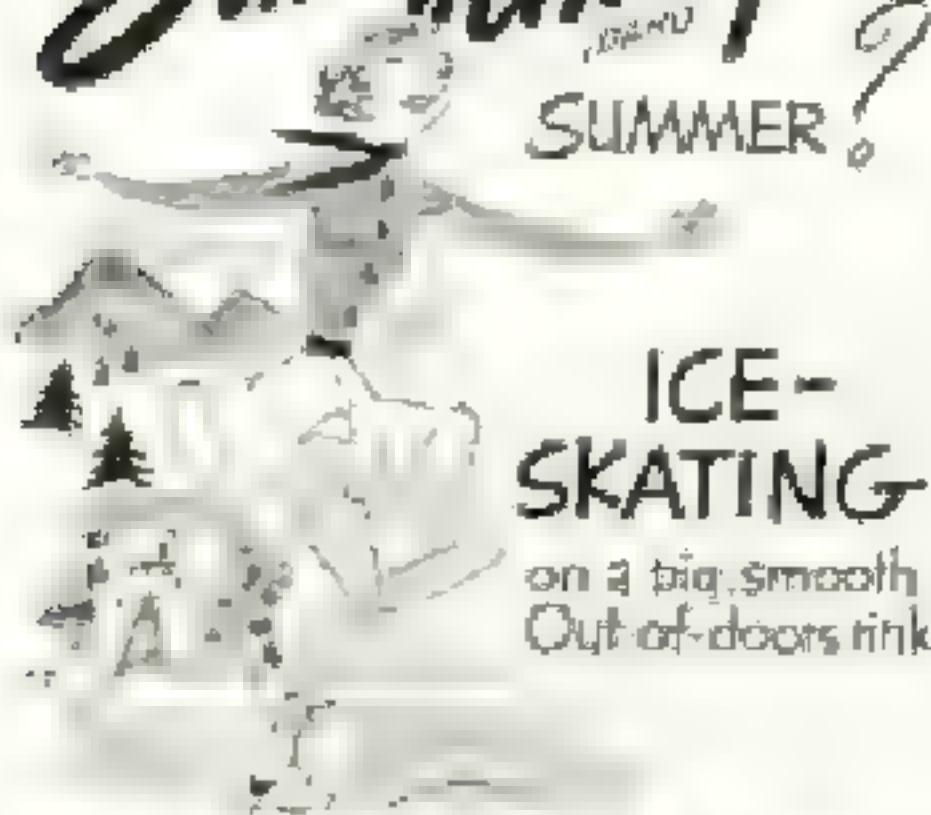
## HERTZ *Rent-A-Car* SYSTEM

WHEREVER YOU GO    WHATEVER YOU DO    YOU CAN RENT A NEW CAR FROM HERTZ AS EASY AS





# WHAT'S IN A Sun Valley SUMMER?



## ICE-SKATING

on a big, smooth  
Out-of-doors rink

An exclusive Sun Valley fun feature! Skates can be rented and there's expert instruction available.

## SWIMMING

in two  
out-in-the open pools

The cool, crystal clear water is always spread out to swimmers and sun bather.



## GOLF

The lovely course is perfect, challenging to all players and just too tricky for beginners.



## HORSEBACK RIDING

There's a never ending succession of scenic mountain trails to ride. The "Mammoth Valley" visitors try it for the first time.



## FISHING

Talk about being this close to Rainbow, Cutthroat, Brown, and Steelhead Trout, Salmon, Chinook, and Steelheads are ready and waiting.



## FOR RESERVATIONS

Write to the Union Pacific Railroad, 610 Fifth Ave., New York 17, N.Y. or to the Sun Valley Hotel, 1000 Main St., Sun Valley, Idaho. For more information, write to the Union Pacific Railroad, 610 Fifth Ave., New York 17, N.Y.



OWNED AND OPERATED BY  
UNION PACIFIC RAILROAD



## ADVANCE

A comprehensive map of France in color, showing the network of the French National Railways, makes it easy to arrange your trip in advance. There's also a larger color map of Continental Europe with the important Rail connections.

**Free** Please send me illustrated "Railroad Map of France and Europe".

Write to Dept. NG 3

FRENCH NATIONAL RAILROADS, 610 FIFTH AVE., N.Y.



## TAKE YOUR CAR ACROSS LAKE MICHIGAN

LAKE MICHIGAN COAST GUARDIAN  
BROOKLYN, N.Y. 11201  
MILWAUKEE, WIS. and MUSKEGON, MICH.  
**S.S. MILWAUKEE CLIPPER**



Enjoy this  
Wonderful  
Six-Hour  
Voyage

For more information, write to the Milwaukee Clipper Ferry, 1000 Main St., Sun Valley, Idaho. For more information, write to the Union Pacific Railroad, 610 Fifth Ave., New York 17, N.Y.

TICKET OFFICES AND DOCKS  
MILWAUKEE, WIS. MUSKEGON, MICH.



*I've never had a loss...*

## What has insurance done for me?

Though you have never suffered a loss, your insurance premium buys many things you would not wish to be without.

Use the protection against misfortune—the building that *did not* burn; the elevator that *did not* drop; the boiler that *did not* explode; the dangerous manufacturing process made safe for workers; the accidents at a bad intersection that were prevented; the wiring or appliances that did not fail and destroy your home.

These and myriad other mishaps in which you or yours might have been involved, did not happen because the unflinching vigilance of insurance inspectors and engineers prevented them.

Added to this, the greatest payment insurance makes to you is freedom from worry—a feeling of security—peace of mind!



THE CONTINENTAL  
INSURANCE COMPANY



FIDELITY-PHENIX  
FIRE INSURANCE COMPANY

## 100 YEARS

1953 marks 100 years of proved insurance protection by two American Fore Companies: The Continental and the Fidelity-Phoenix.

For the name of a nearby American Fore Insurance Man call Western Union by number or ask for Operator 25.

★ The Continental Insurance Company

★ Fidelity-Phoenix Fire Insurance Company

★ Niagara Fire Insurance Company

★ American Eagle Fire Insurance Company

★ The Fidelity and Casualty Company of New York



Address : Chicago - Bureau - New York - Headquarters  
 Telephone No. : District Office - Main Office



Relax at **Minaki** Ontario

in the lovely Lake-of-the-Woods region



**Relax in an outdoor world!** Fishing? There are bass, bluegill, muskie, pike, willow, golden shiner and many more. So, relax. **Boating?** From motor sports to pleasure boats, there are many choices. **Sports?** Pleasure, recreation at Canadian National - Muskoka Lodge. Ask about this or other exciting Ontario resorts. Your nearest Canadian National office or Travel Agent will tell you about them and the Top Vacations listed. "We'll tell you where and take you there."



9. FURNISH ALL "C" TYPE HOLES IN LATHING.

## Choose one of Canada's 10 Top Maple Leaf Vacations



**Voorwerp:** De afbouw van de oude kerk en het bouwen van een nieuwe kerk op dezelfde plaats.

**Address Change**—The following persons have changed their addresses since the last issue of the directory:

Alaska Census Bureau  
Juneau, Alaska 99801

British Columbia

#### 4 Foreign Sales and Investments

Hudson Bay

Wings: *Wings of the Woods*

[illegible]

• **Chlorine**  $\text{HCl}$ ,  $\text{HClO}_2$

From name for the 3rd

Removal of French  
Crests from the  
Coat of Arms

[illegible]

Monitor the National Geographic—If Identical too



# José Ferrer **SLEEPS COOL**

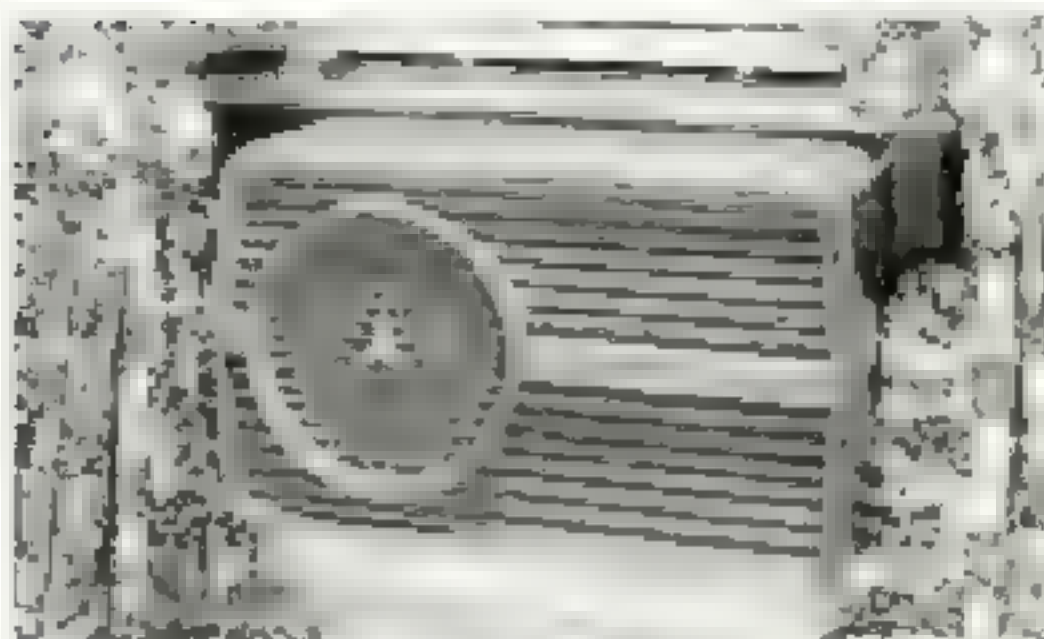
with a low-cost Fedders Room Air  
 Conditioner in his bedroom!



**JOSÉ FERRER**  
 Starring in  
**"MOULIN ROUGE"**  
 Color by Technicolor...  
 Released thru United Artists

You can have the amazing new Fedders unit in your bedroom, livingroom or office for as little as \$59.95! It circulates sparkling cool air, wrings out excess humidity. Extra large filters catch dust, soot and pollen. Filter relieve hay fever, keeps rooms cleaner. Exclusive Built-In Weather Bureau gives you the weather you want at the flick of a button! The Fedders unit fits on windowsill without alterations, pipes or ducts. Mail coupon for fascinating booklet on health protection, new home comfort!

**FEDDERS**  
*A Great Name in Comfort*



The Fedders Room Air Conditioner...  
 The only one that's built-in weather bureau.

MAIL THIS COUPON TODAY!

I am interested in learning more about the  
 Fedders Room Air Conditioner. Please send me  
 a free booklet on health protection, new home  
 comfort. I am also interested in learning more  
 about the Fedders Room Air Conditioner. Please  
 send me a free booklet on health protection, new  
 home comfort. I am also interested in learning  
 more about the Fedders Room Air Conditioner.  
 Please send me a free booklet on health protection,  
 new home comfort. I am also interested in learning  
 more about the Fedders Room Air Conditioner.

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Mention this Special Code 111 - I'll send you

ride a

# **RALEIGH**

CHAMPION OF BICYCLES • BICYCLE OF CHAMPIONS



For the  
 pleasure  
 of riding  
 that makes it so  
 easy to handle - for  
 extra safety features that  
 make it the safest on the  
 road - for the smooth, steady  
 ride that makes riding effortless  
 - you'll choose a Raleigh every time.  
 For free pamphlets and dealer information -

Raleigh Industries of America Inc., Dept. G  
 669 Boylston Street, Boston, Massachusetts



More wonderful spots where the incomparable  
 beauty of Massachusetts - no picture can portray  
 its atmosphere of eternal charm  
 and historic pageantry.

Why not plan your bags and see for yourself?

SEE  
**Massachusetts**  
 THE COMPLETE BACKPACKER

Mass. Department of Industrial Cooperation  
 State House, Boston, Mass. Dept. 809  
 2424 and 2425 - 2426 - 2427

Name \_\_\_\_\_  
 Address \_\_\_\_\_



No. 1000

No. 1001

No. 1002

No. 1003

No. 1004 Medium Stub

No. 1005 Broad Stub

No. 1006

**ADD**  
it to the  
barrel of an  
Esterbrook  
Fountain Pen

**CHOOSE**

the right point  
for the way  
you write...  
by number

TO SELECT OR REPLACE  
...HERE'S ALL YOU DO

**WRITE**  
with the pen that  
writes your way  
...naturally

**Esterbrook**

**FOUNTAIN PEN**

THE WORLD'S MOST PERSONAL FOUNTAIN PEN

Mention the National Geographic in your order.









**North American  
VAN LINES Inc.**

**AMERICA'S LEADING  
LONG-DISTANCE  
MOVING ORGANIZATION**

**FREE GANT ROAD ATLAS** Need moving or storage? Phone your local North American Agent for estimate. When he has given you an estimate you are entitled to a GANT Road Atlas FREE. Offer available only through North American Agents in Continental U.S. & Canada.

**MOVE IN, TOO!** Yes, you can arrange for complete, no work moving service. By calling on your North American Van Lines Agent. Valued possessions packed scientifically. Safe on time delivery to any point in the U.S.A. or Canada. You can have everything unpacked and placed in position. Better move a ways, the North American Way. Write for FREE booklet "Happier Move" to North American Van Lines Inc., Dept. 2800, Ft. Wayne, Ind.

**Right Move**

**Call your LOCAL North American Agent**  
Explain your moving needs and costs



*Vacation Variety—*  
**NEW JERSEY**  
*Has it!*



New Jersey has—800 lakes  
New Jersey has—125 miles of  
Atlantic Ocean saltwater surf  
New Jersey has—picturesque  
countryside—hospitals—resorts  
New Jersey has—fishing  
salt or fresh water.  
New Jersey has—gay resort  
spots for fun and relaxation.  
It's an experience to spend  
your vacation in New Jersey  
—it's more fun at less cost!

**FREE  
BOOKLET  
TO GUIDE  
YOU!**

Write today for  
your free copy of  
full-colored, illustrated booklet "Vacation Variety—New Jersey Has It!"

State Promotion Section, Box 785  
Dept. of Conservation & Economic Development  
520 East State Street, Trenton, N.J.

*Self-winding*  
**CALENDAR WATCH**

the timeliest watch!



Patented  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985  
1986  
1987  
1988  
1989  
1990  
1991  
1992  
1993  
1994  
1995  
1996  
1997  
1998  
1999  
2000  
2001  
2002  
2003  
2004  
2005  
2006  
2007  
2008  
2009  
2010  
2011  
2012  
2013  
2014  
2015  
2016  
2017  
2018  
2019  
2020  
2021  
2022  
2023  
2024  
2025  
2026  
2027  
2028  
2029  
2030

calendar  
1 2 3 4 5 6 7 8 9 10 11 12  
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
JAN FEB MAR APR MAY JUN JUL AUG SEPT OCT NOV DEC

**MOVADO**

MADE BY THE MOVADO COMPANY

SALE AND SERVICE BY LEADING JEWELERS ALL OVER THE WORLD

1000 10th Street, N.W., Atlanta, Georgia 30309  
1-800-368-3688



[illegible]

1990-1991 7th Census, Census Canada, [1990] 1991, p. 9.





To the man  
who is ready for a

Leica

...the ...

[illegible]

Leica

**CAMERAS**  
**LENS**  
**ACCESSORIES**

Figure 1. The effect of the concentration of the  $\text{H}_2\text{O}_2$  solution on the amount of the released  $\text{H}_2\text{O}$  from the  $\text{H}_2\text{O}_2$ -loaded hydrogel.



Your family is in for a  
**great vacation**

It is in WASHINGTON, WISCONSIN where the temperature during the summer can be averages 80° Higher every type of summer activity, swimming, boating, fishing, etc. is at its best. Also lakes and rivers abound for all kinds of fishing. The scenery is beautiful, the weather is just what is needed and the people are friendly and cooperative. The food is good and the prices are moderate.

Wonderful  
WISCONSIN



WISCONSIN CONSERVATION DEPARTMENT  
Information Section  
Route 71, State Office Bldg., Madison 2, Wisconsin

[illegible]

Send today  
for  
**FREE  
BOOK**



Marathon the Mar-a-Lago Golf Club—It's a beautiful view.



Make this your year  
to explore

# Marvelous Minnesota!



The excitement you come out when you visit Minnesota. Whether your kind of fun is the pursuit of artifact or historical fact, flora or fauna, you'll find Minnesota land hunting grounds. It has been since "Indian Days" when the territory was a battleground between Sioux and Chippewa since the receding glaciers carved out Minnesota's 10,000 lakes. It's the Paul Bunyan playground, exciting for its contrasts and diversions . . . where every day offers a completely new and different set of thrills. For more information use the coupon below.

#### Minnesota Tourist Information

Department NG-1, State Capitol, St. Paul 1, Minn.

Please send me information to:

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

**MINNESOTA**  
The Land of Sky Blue Waters



**NOW! SERVE COLD  
DRINKS, SNACKS, RIGHT  
FROM YOUR EASY CHAIR!**

## Serve! Electric Wonderbar®

PORTABLE, SILENT REFRIGERETTE  
STYLED AS SMART FURNITURE



It freezes ice cubes. Cools sodas, mixers and more. Refrigerates your convenience food. Serves party center, TV snack spot, or bar on wheels. All in the sleekest, smartest portable cabinet you'll find!

5 year warranty on speed freezing system. Just plug in—AC or DC, 12 to 240 volts.

Make gray, blond, white. Bases and accessories optional. Weather proofing kit extra.



From \$199.00

# Serve!

The name to watch for great advances in  
REFRIGERATION and AIR CONDITIONING  
GAS or ELECTRIC





destination...

**VACATION**

transportation...

**TRAILWAYS**

**THRU-LINERS**

the *Smartest* distance  
between two points

Mail coupon for  
your choice of

**TRAILWAYS**  
*All expense tours*

**TOMMY THRU-LINER:**

"Your highway has) from coast to coast."

**FOR CONVENIENCE** — Thru-liners travel direct routes to your destination. No change of bus or baggage.

**FOR COMFORT** — Restful relaxation is yours to enjoy aboard modern, air-conditioned Thru-liners.

**FOR SAFETY** — Thru-liner travel is America's safest means of transportation.

**FOR ECONOMY** — Have more money for fun on your vacation. There are no lower fares.





ONLY **Vermado** AIR CONDITIONERS

give **20% more**

**COOLING EFFECT**

with **EXCLUSIVE**

**Verma-Cooling**

**Compare Vermado Features with Features**

Of course, Vermado, like most room air conditioners, cools and dehumidifies the air. But Vermado does more. It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

It has a built-in electric fan that can be set to blow air directly at you. It has a built-in electric fan that can be set to blow air directly at you.

**COOL**

carefree,  
incomparable  
for summer  
vacations

**SAN**

**DIEGO**

**CALIFORNIA**

ASK YOUR TRAVEL AGENT

SEND FOR FREE COLOR FOLDER

Fill in and mail to: SAN DIEGO-CALIFORNIA CLUB  
670 W. Broadway, San Diego, California 92101

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

I will come by Auto Train Air Bus



OUR FREE FOLDER  
IS COLORFUL PROOF!

San Diego is cool!  
You'll sleep under  
blankets every night  
all summer long.

There is unequalled  
natural beauty — the  
Blue Mountains, miles of  
beaches, palm  
fringed mountains and  
valleys green with  
cactus, and the desert  
beyond. San Diego is  
a fabulous vacation  
playland. World-famous  
beaches, swimming, an abundance  
of all sorts of sports. It's a short 18  
miles to Old Mexico  
for weekend racing.  
Ja-Ala! Live, dance,  
shops and night life.  
All this plus famous  
nearby places to visit  
like La Jolla, Miramar  
and Coronado make San Diego and  
San Diego County  
cool and carefree, an  
incomparable for your  
summer vacation. See  
our beautiful folder  
and come this summer.



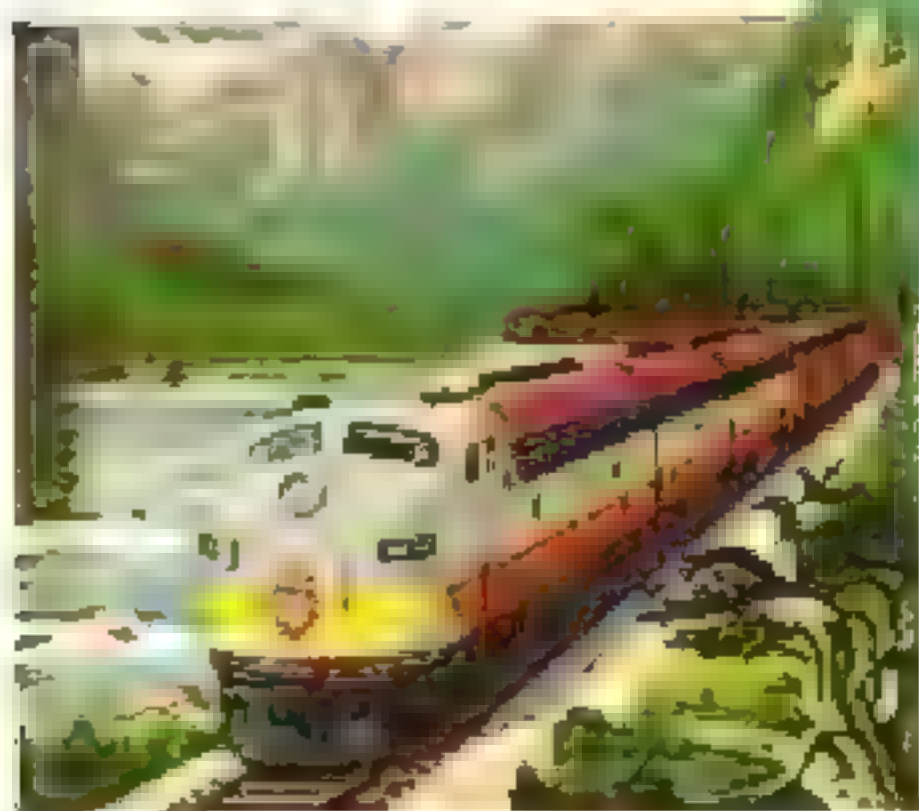
# CANADA

passes your train window...

You can afford to see varied Canada. To aid the budget, Canadian Pacific has sleeping, tourist sleepers and coaches with inclining seats. Sportsmen! Coastal! Modern comfort with the best Canadian Pacific service!

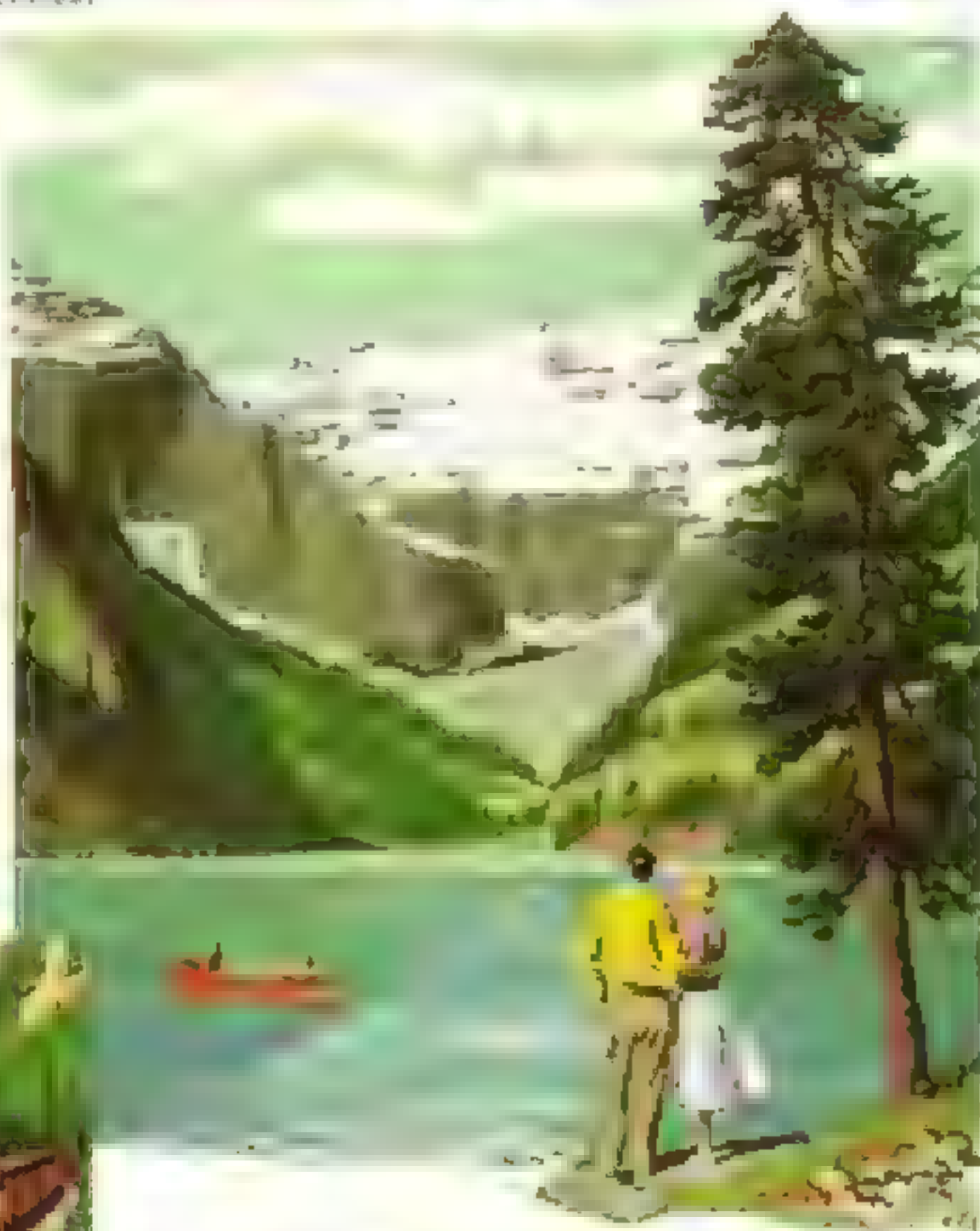


**Great picture-window views—**all yours by Canadian Pacific train! East-to-West, there's scenic, walled Quebec; metropolitan Montreal; North Shore of the Great Lakes; the great lakes; French plains; you mile-high into the shining Canadian Rockies!



Canada is news! See it by

## Canadian Pacific



**Stop off at Banff or Lake Louise** for vacation tours in the Canadian Rockies. Marvel at Columbia Icefield, Kicking Horse Pass, Emerald Lake, other grandeur. *Play in mountain summer.* Golf on the famous Banff Springs. You can also enjoy the enchanting Chateau Lake Louise. Or "is, good" in comfort at any of several mountain lodges. Have the time of your life—in Canada, land of beauty unlimited!

**Ask your agent about** Empire Builders, the new Canadian Pacific line in down East Canada.

Travel and Vacation Service





☐ If publisher ☐ If editor

properly prepared with the necessary  
preliminary ground work with the  
V. L. and your own Sketches and  
your Sketches. It is the only way  
to make a good sketch of the  
subject. It is the only way to make  
a good sketch of the subject.

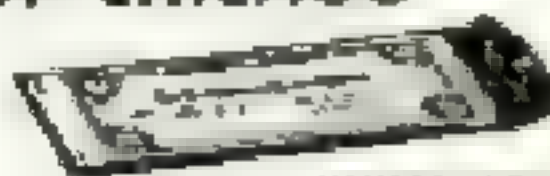
☐ Acting on T1    ☐ Playing immediately  
 | Deriving steps

2. *Phylogenetic relationships*—The 16S rDNA of the 12 strains were sequenced. The sequences were aligned with the sequences of other *Brachycolp* species available in Genbank. The phylogenetic relationships were determined by the neighbour-joining method. The bootstrap values were determined by 1000 replicates.

South Group      1000000000  
 1000000000

[illegible]

FOR ALL INFORMATION CONTACT WITH



MPBBS - 10866-4

THE  
JOURNAL OF  
THE

THE PASO COUNTY TEXAS

EL PASO SUBURBAN CLUB

[illegible]

Name \_\_\_\_\_

**Abstract**

# 100

2nd Floor

[illegible]

### 31. CARD VACATION PLAYGROUND OF THE BOWEN

**SEND FOR**

# SEND FOR Free Record

## START SPEAKING

**FRENCH**  
**SPANISH**  **ALMOST OVERNIGHT!**

Figure 1. The effect of the concentration of the  $\text{Ca}^{2+}$  solution on the  $\text{Ca}^{2+}$  concentration in the  $\text{Ca}^{2+}$  solution. The  $\text{Ca}^{2+}$  concentration in the  $\text{Ca}^{2+}$  solution was 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9, 11.0, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9, 12.0, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 13.0, 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8, 13.9, 14.0, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8, 14.9, 15.0, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7, 15.8, 15.9, 16.0, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 17.0, 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8, 17.9, 18.0, 18.1, 18.2, 18.3, 18.4, 18.5, 18.6, 18.7, 18.8, 18.9, 19.0, 19.1, 19.2, 19.3, 19.4, 19.5, 19.6, 19.7, 19.8, 19.9, 20.0, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9, 21.0, 21.1, 21.2, 21.3, 21.4, 21.5, 21.6, 21.7, 21.8, 21.9, 22.0, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8, 22.9, 23.0, 23.1, 23.2, 23.3, 23.4, 23.5, 23.6, 23.7, 23.8, 23.9, 24.0, 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.8, 24.9, 25.0, 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 25.8, 25.9, 26.0, 26.1, 26.2, 26.3, 26.4, 26.5, 26.6, 26.7, 26.8, 26.9, 27.0, 27.1, 27.2, 27.3, 27.4, 27.5, 27.6, 27.7, 27.8, 27.9, 28.0, 28.1, 28.2, 28.3, 28.4, 28.5, 28.6, 28.7, 28.8, 28.9, 29.0, 29.1, 29.2, 29.3, 29.4, 29.5, 29.6, 29.7, 29.8, 29.9, 30.0, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 30.8, 30.9, 31.0, 31.1, 31.2, 31.3, 31.4, 31.5, 31.6, 31.7, 31.8, 31.9, 32.0, 32.1, 32.2, 32.3, 32.4, 32.5, 32.6, 32.7, 32.8, 32.9, 33.0, 33.1, 33.2, 33.3, 33.4, 33.5, 33.6, 33.7, 33.8, 33.9, 34.0, 34.1, 34.2, 34.3, 34.4, 34.5, 34.6, 34.7, 34.8, 34.9, 35.0, 35.1, 35.2, 35.3, 35.4, 35.5, 35.6, 35.7, 35.8, 35.9, 36.0, 36.1, 36.2, 36.3, 36.4, 36.5, 36.6, 36.7, 36.8, 36.9, 37.0, 37.1, 37.2, 37.3, 37.4, 37.5, 37.6, 37.7, 37.8, 37.9, 38.0, 38.1, 38.2, 38.3, 38.4, 38.5, 38.6, 38.7, 38.8, 38.9, 39.0, 39.1, 39.2, 39.3, 39.4, 39.5, 39.6, 39.7, 39.8, 39.9, 40.0, 40.1, 40.2, 40.3, 40.4, 40.5, 40.6, 40.7, 40.8, 40.9, 41.0, 41.1, 41.2, 41.3, 41.4, 41.5, 41.6, 41.7, 41.8, 41.9, 42.0, 42.1, 42.2, 42.3, 42.4, 42.5, 42.6, 42.7, 42.8, 42.9, 43.0, 43.1, 43.2, 43.3, 43.4, 43.5, 43.6, 43.7, 43.8, 43.9, 44.0, 44.1, 44.2, 44.3, 44.4, 44.5, 44.6, 44.7, 44.8, 44.9, 45.0, 45.1, 45.2, 45.3, 45.4, 45.5, 45.6, 45.7, 45.8, 45.9, 46.0, 46.1, 46.2, 46.3, 46.4, 46.5, 46.6, 46.7, 46.8, 46.9, 47.0, 47.1, 47.2, 47.3, 47.4, 47.5, 47.6, 47.7, 47.8, 47.9, 48.0, 48.1, 48.2, 48.3, 48.4, 48.5, 48.6, 48.7, 48.8, 48.9, 49.0, 49.1, 49.2, 49.3, 49.4, 49.5, 49.6, 49.7, 49.8, 49.9, 50.0, 50.1, 50.2, 50.3, 50.4, 50.5, 50.6, 50.7, 50.8, 50.9, 51.0, 51.1, 51.2, 51.3, 51.4, 51.5, 51.6, 51.7, 51.8, 51.9, 52.0, 52.1, 52.2, 52.3, 52.4, 52.5, 52.6, 52.7, 52.8, 52.9, 53.0, 53.1, 53.2, 53.3, 53.4, 53.5, 53.6, 53.7, 53.8, 53.9, 54.0, 54.1, 54.2, 54.3, 54.4, 54.5, 54.6, 54.7, 54.8, 54.9, 55.0, 55.1, 55.2, 55.3, 55.4, 55.5, 55.6, 55.7, 55.8, 55.9, 56.0, 56.1, 56.2, 56.3, 56.4, 56.5, 56.6, 56.7, 56.8, 56.9, 57.0, 57.1, 57.2, 57.3, 57.4, 57.5, 57.6, 57.7, 57.8, 57.9, 58.0, 58.1, 58.2, 58.3, 58.4, 58.5, 58.6, 58.7, 58.8, 58.9, 59.0, 59.1, 59.2, 59.3, 59.4, 59.5, 59.6, 59.7, 59.8, 59.9, 60.0, 60.1, 60.2, 60.3, 60.4, 60.5, 60.6, 60.7, 60.8, 60.9, 61.0, 61.1, 61.2, 61.3, 61.4, 61.5, 61.6, 61.7, 61.8, 61.9, 62.0, 62.1, 62.2, 62.3, 62.4, 62.5, 62.6, 62.7, 62.8, 62.9, 63.0, 63.1, 63.2, 63.3, 63.4, 63.5, 63.6, 63.7, 63.8, 63.9, 64.0, 64.1, 64.2, 64.3, 64.4, 64.5, 64.6, 64.7, 64.8, 64.9, 65.0, 65.1, 65.2, 65.3, 65.4, 65.5, 65.6, 65.7, 65.8, 65.9, 66.0, 66.1, 66.2, 66.3, 66.4, 66.5, 66.6, 66.7, 66.8, 66.9, 67.0, 67.1, 67.2, 67.3, 67.4, 67.5, 67.6, 67.7, 67.8, 67.9, 68.0, 68.1, 68.2, 68.3, 68.4

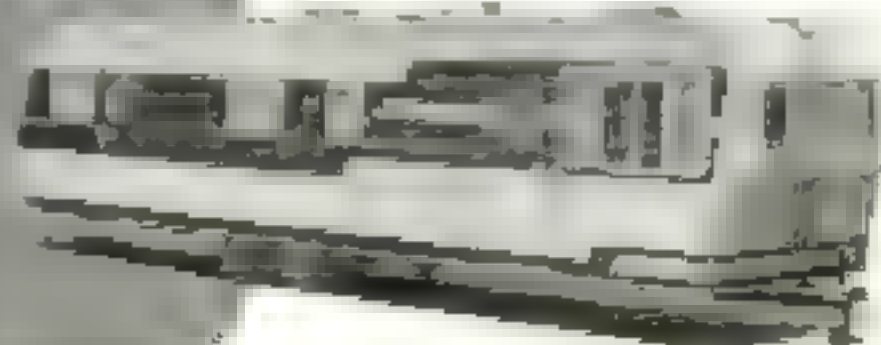
2000年12月15日

**Get the FACTS**

For recreational living or retirement Schult offers utmost value. Write for full information.

**SCHULT CORP.**

DEPT 1103 ELKHART, INDIANA



Mention the National Geographic — It tells how you





## Get the best out of your mind with this different dictating machine!

Your success depends not just on what's in your mind but what you get out of your mind — how well you communicate! And that's why the Dictaphone TIME-MASTER is the run-away favorite of busy people.

Just pick up the phone, talk, and you'll soon find out how easy it is to get the best out of your mind.

TIME-MASTER is so simple to use it puts wings on your words.

Your voice comes through with F.M. clarity on

the new *Dictabelt*, exclusive with TIME-MASTER. Your words are transcribed from *Dictabelt* with perfection so clear that she'd think she's listening to F.M. radio!

It's an age of plastics and electronics, and Dictaphone Corporation has taken advantage of both to bring you the remarkable TIME-MASTER and the even more remarkable new *Dictabelt*. The inexpensive, convenient *Dictabelt* can be used here and thrown away, filed or mailed.

Why wait longer? The coupon will deliver the promise promptly!



# Dictaphone<sup>®</sup>

CORPORATION

Greatest name in dictation



IT'S  
SAID—

AND  
DONE!



Please send me a Dictaphone<sup>®</sup> TIME-MASTER  
and a Dictaphone<sup>®</sup> *Dictabelt* and follow  
the instructions for use.

Name

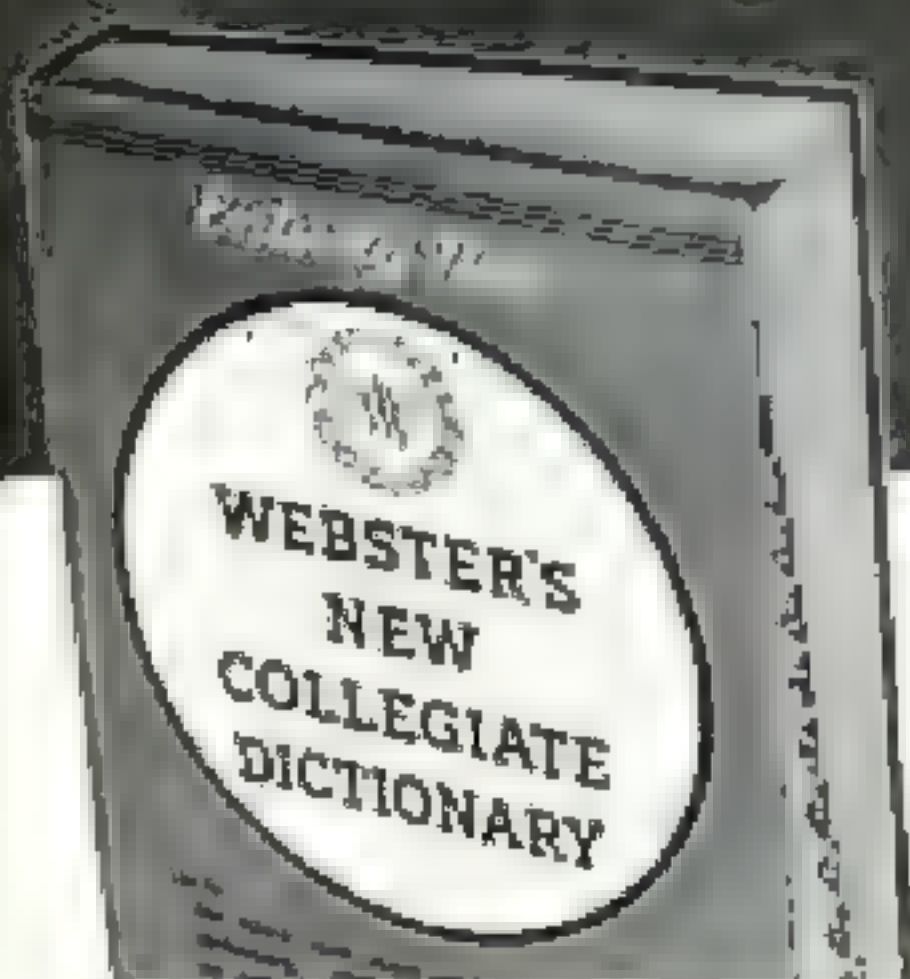
Company

Street

City & Zone  State



Only a Dictionary  
Backed by  
**UNQUESTIONED  
AUTHORITY**  
Is Worth Using



You can rely with perfect confidence on the authority, accuracy, and up-to-dateness of

**WEBSTER'S NEW  
COLLEGIATE DICTIONARY**  
*A Merriam-Webster*

THE latest in the famous Webster's Collegiate series that has succeeded how editions for more than fifty years has been nationally accepted as the most authoritative handbook in the field.

With the help of this superlative hand book you will read with more understanding and write with more assurance, speak with more effectiveness.

Webster's New Collegiate contains 120,000 entries, selected with careful discrimination, giving

clear definitions, exact pronunciation, accurate etymologies, correct spelling, derivation, abbreviations, synonyms, etc.

It presents a wealth of information on persons, places, weights, measures, monetary units, signs and symbols, rules for punctuation, use of capitals, etc.

And there are illustrations, 1,400 pages. A book of extraordinary length and value. Each bound in hard cover, \$5.00 and up. Write for folder.

Ask for and those other Merriam-Webster

Webster's Unabridged Dictionary \$12.50

Webster's Pocket-sized Dictionary 2.50

Webster's Concise Dictionary 1.50

G & C Merriam Co., Publishers, Dept. 115 Springfield 2, Mass.

# THE WEST



...nature's greatest show!

Nowhere on earth will you find more wonders of beauty than await you in Colorado and California... rugged, majestic beauty—the lush upland life of Nature's best provision for out-of-doors living. The West is the best for a real vacation.



FOR LUXURIOUS TRAVEL

to **COLORADO**... it's the Rocky Mountain Rocket

Direct to either Denver or Colorado Springs

to **CALIFORNIA**... Ride the Golden State

(The Low Altitude Way to California)

Both trains provide luxury equipment for either COAST TO COAST LIMAN travel, private dining, sectional spaces, reclining coach chairs—reversible, observation lounge, diner and club diner, serving delicious meals and snacks.

## ALL-EXPENSE TOURS



are available on a resort information. Ask a Rock Island Representative or write: A. D. Martin, Gen'l Passenger Traffic Mgr., La Salle Street Station, Chicago 5, Illinois.

Your Friend  
The Rock Island  
System







## How "young" will they be at 65?

Young people today have an excellent chance to live beyond their sixty-fifth birthday. Already there are over 12 million Americans who are past 65. By the end of the century, it is estimated that there will be nearly twice as many.

Most of these millions can look forward to being healthier, happier, "younger" after 65 than people of that age have ever been. This has been made possible chiefly by medical advances.

If you are one of those to whom the word "old age" conjures up an unpleasant picture, you are likely to be heartened by the views of authorities. They say that old age need not be *endured*; that it can actually be *enjoyed*. This depends largely, however, on what you do to safeguard your health.

Over the years, adjustments in diet may be desirable. While the *quantity* of food required in later life usually becomes less, the need for the essential proteins, vitamins, and minerals remains unchanged.

Moreover, physical exercise is a guard against obesity, which burdens the heart and often paves the way for coronary ailments and high blood pressure.

Of course the best way to preserve good health is to place yourself under your doctor's care and go to him for a periodic health examination as often as he recommends. By following you through the years, your doctor will also come to know you as an *individual* . . . what your personal problems are, what strains your work places on you, what your real life is, and times of stress. Such information

is of great value to the doctor in solving many health problems.

He can also advise you about your daily habits—such as getting plenty of rest and sleep and practicing a healthy diet.

Increasingly, as the years elapse, you will depend more and more upon one's own initiative. This is why it is important to keep up your outside interests, including hobbies. Such activities will help keep your mind from becoming too much preoccupied with work.

A good rule of life should we take good health for granted? Rather, we should plan and work for it, just as we do for the rest of our worthwhile life. By doing so, more and more of your years will be *enjoyed*. And this is true, no matter what age, however old, in our society, culture, and milieu.

### Metropolitan Life

Insurance

Company



Please send me a copy of Metropolitan's new book, "Let's Stay Young Forever."

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_







## DANGER out for lunch!

**D**ive-bombers pick the flock of *Red-tailed Hawks* for lunch. The raptors then attack speeds of 180 miles an hour.

Some birds are born to fly. And they do. Over the course of their lives, they can fly for hours.

They have a strong sense of direction. And they strike out to the space of the sky. They are the most powerful of all birds. They are the most powerful of all birds.

Some birds are born to fly. And they do. Over the course of their lives, they can fly for hours. They are the most powerful of all birds. They are the most powerful of all birds.

They are the most powerful of all birds. They are the most powerful of all birds. They are the most powerful of all birds. They are the most powerful of all birds. They are the most powerful of all birds. They are the most powerful of all birds.

### *The Travelers*

by [illegible]  
[illegible]





LEADS  
DUNK  
FILLING

# Sheaffer's SNORKEL pen

THE ONLY PEN YOU FILL  
WITHOUT WIPING OFF THE POINT

You'll never again have a mess on your hands when you own Sheaffer's Snorkel Pen. See how its magic filling tube reaches out to drink the ink, while all others must be "dunked" well past the point. Fills instantly, at the finger-touch. Cleans and flushes itself at every filling, so only fresh ink remains, safely leak-sealed in the barrel. Try it yourself... and take special note of its superb writing smoothness.

**SHEAFFER'S**  
SHEAFFER PEN COMPANY

100%  
Sheaffer  
Quality  
Guaranteed  
\$12.50 in Colors  
Available Only \$8.75

Simple as...

1. Built-in filling tube reaches beyond tip of point.
2. Push down on pen. Ink instantly flows into tube at a single finger stroke.
3. Push back & forward. Pen is ready to write. No pen wiping needed!



# Kodak Signet 35 Camera



Great new  
team for  
color slides

**Kodak's finest lens**      **Model K-1**      **See Kodak's new**  
**camera**      **100**      **1/250**      **1/500**      **1/1000**      **1/2000**      **1/4000**      **1/8000**      **1/16000**      **1/32000**      **1/64000**      **1/128000**      **1/256000**      **1/512000**      **1/1024000**      **1/2048000**      **1/4096000**      **1/8192000**      **1/16384000**      **1/32768000**      **1/65536000**      **1/131072000**      **1/262144000**      **1/524288000**      **1/1048576000**      **1/2097152000**      **1/4194304000**      **1/8388608000**      **1/16777216000**      **1/33554432000**      **1/67108864000**      **1/134217728000**      **1/268435456000**      **1/536870912000**      **1/1073741824000**      **1/2147483648000**      **1/4294967296000**      **1/8589934592000**      **1/17179869184000**      **1/34359738368000**      **1/68719476736000**      **1/137438953472000**      **1/274877906944000**      **1/549755813888000**      **1/1099511627776000**      **1/2199023255552000**      **1/4398046511104000**      **1/8796093022208000**      **1/17592186044416000**      **1/35184372088832000**      **1/70368744177664000**      **1/140737488355328000**      **1/281474976710656000**      **1/562949953421312000**      **1/1125899906842624000**      **1/2251799813685248000**      **1/4503599627370496000**      **1/9007199254740992000**      **1/18014398509481984000**      **1/36028797018963968000**      **1/72057594037927936000**      **1/144115188075855872000**      **1/288230376151711744000**      **1/576460752303423488000**      **1/1152921504606846976000**      **1/2305843009213693952000**      **1/4611686018427387904000**      **1/9223372036854775808000**      **1/18446744073709551616000**      **1/36893488147419103232000**      **1/73786976294838206464000**      **1/147573952589676412928000**      **1/295147905179352825856000**      **1/590295810358705651712000**      **1/1180591620717411303424000**      **1/2361183241434822606848000**      **1/4722366482869645213696000**      **1/9444732965739290427392000**      **1/18889465931478580854784000**      **1/37778931862957161709568000**      **1/75557863725914323419136000**      **1/151115727451828646838272000**      **1/302231454903657293676544000**      **1/604462909807314587353088000**      **1/1208925819614629174706176000**      **1/2417851639229258349412352000**      **1/4835703278458516698824704000**      **1/9671406556917033397649408000**      **1/19342813113834066795298816000**      **1/38685626227668133590597632000**      **1/77371252455336267181195264000**      **1/154742504910672534362390528000**      **1/309485009821345068724781056000**      **1/618970019642690137449562112000**      **1/1237940039285380274899124224000**      **1/2475880078570760549798248448000**      **1/4951760157141521099596496896000**      **1/9903520314283042199192993792000**      **1/19807040628566084398385987584000**      **1/39614081257132168796771975168000**      **1/79228162514264337593543950336000**      **1/158456325028528675187087900672000**      **1/316912650057057350374175801344000**      **1/633825300114114700748351602688000**      **1/1267650600228229401496703205376000**      **1/2535301200456458802993406410752000**      **1/5070602400912917605986812821504000**      **1/10141204801825835211973625643008000**      **1/20282409603651670423947251286016000**      **1/40564819207303340847894502572032000**      **1/81129638414606681695789005144064000**      **1/162259276829213363391578010288128000**      **1/324518553658426726783156020576256000**      **1/649037107316853453566312041152512000**      **1/1298074214633706907132624082305024000**      **1/2596148429267413814265248164610048000**      **1/5192296858534827628530496329220096000**      **1/10384593717069655257060992658440192000**      **1/20769187434139310514121985316880384000**      **1/41538374868278621028243970633760768000**      **1/83076749736557242056487941267521536000**      **1/166153499473114484112975882535043072000**      **1/332306998946228968225951765070086144000**      **1/664613997892457936451903530140172288000**      **1/1329227995784915872903807060280344576000**      **1/2658455991569831745807614120560689152000**      **1/5316911983139663491615228241121378304000**      **1/10633823966279326983230456482242756608000**      **1/21267647932558653966460912964485513**

[illegible]
$$f(x) = \frac{1}{2} \left( \frac{1}{x} + \frac{1}{x^2} \right) \quad (x > 0) \quad \text{and} \quad f(x) = 0 \quad (x \leq 0).$$

**Eastman Kodak Company, Rochester 4, N. Y.**

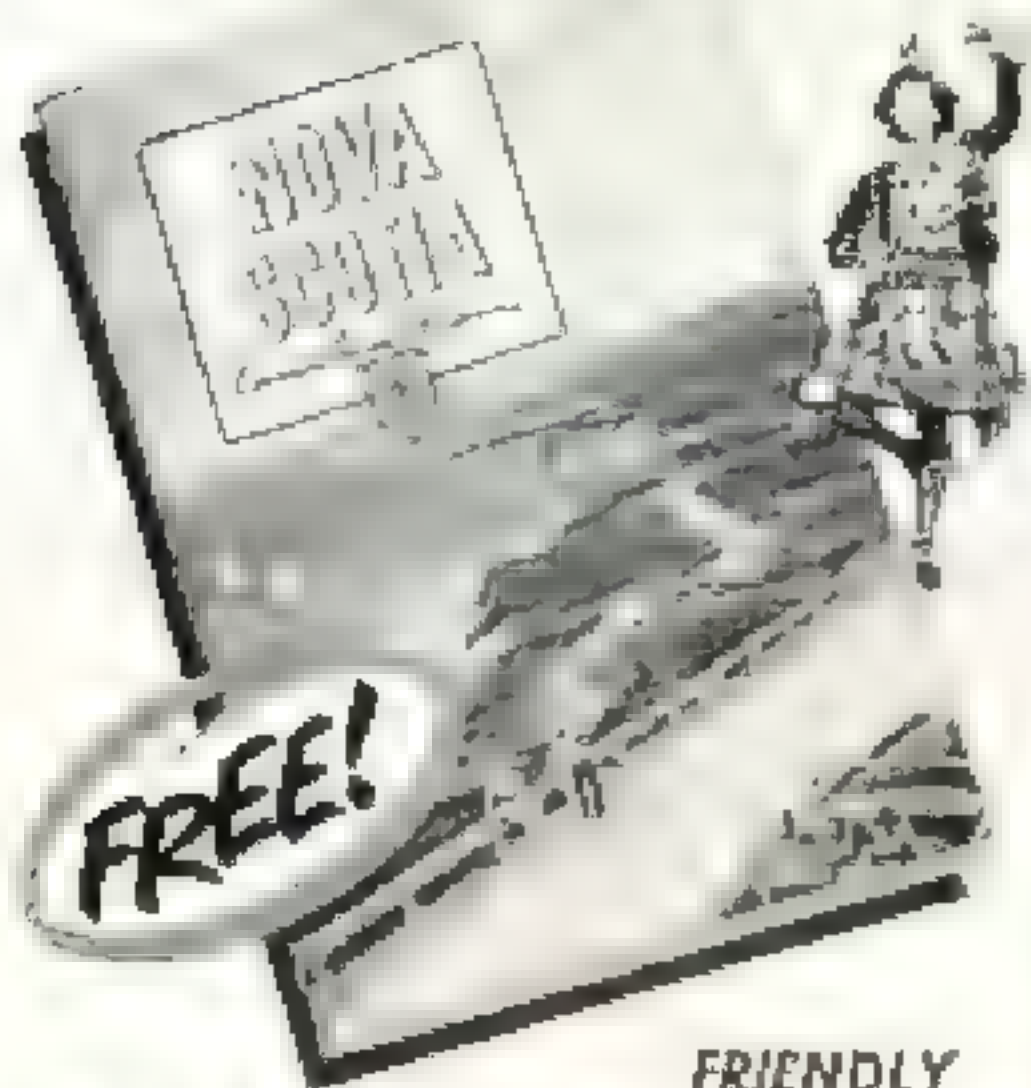
Kodaslide  
Highlux III  
Projector



Kodak



**Your Vacation Fun  
Can Begin TODAY!**



## FRIENDLY NOVA SCOTIA

**CANADA'S OCEAN PLAYGROUND**

Vacation planning is fun... one of the best things about any vacation... when you have informative, colorfully-illustrated literature like this... maps, facts, places to stay... just what you need to get the most out of your visit. You can depend on summer vacation literature for all the information you need to plan your friendly getaway. Nova Scotia's unspoiled beauty, sunny beaches, cool lakes... are now less far away. Now they're just a coupon away... by mailing this coupon.

**Overnight from Boston by Eastern Steamship Lines**

|  |   |
|--|---|
| <p>MONTEREAL</p> <p>BOSTON</p> <p>NEW YORK</p> | <p>ST. JOHN</p> <p><b>NOVA SCOTIA</b></p> <p><b>NOVA SCOTIA</b></p> <p>Bureau of Information</p> <p>P. O. Box 120, Halifax, Nova Scotia</p> <p>Please send me literature to:</p> <p>Name _____</p> <p>Address _____</p> <p>City _____</p> <p>State _____</p> <p>Zip _____</p> <p>Send back this coupon to _____</p> |
|--|---|

## SHE LIKES **ORA** **DENTURE** **CLEANSER!**



"ORA is a wonderful product, and doesn't harm dentures," says Mrs. Lena Crockett, Baltimore, Md.

**NO MORE BRUSHING!** Clean your denture with ORA powder... gently... with the proper technique... 2 or 3 times a day... in a cup of water for 15 minutes or overnight. Denture cleanser... sparkling clean. ORA is pure... safe... to harm dentures... cleanses... keeps them healthy... the the user... to have... ORA. Admiration!

A product of McKESSON & ROBBINS, Incorporated

**Trinidad and Tobago**

Trinidad and Tobago are two of the most beautiful islands in the Caribbean... with white sandy beaches and lush tropical forests... the perfect vacation spot.

**Trinidad & Tobago Tourist Board**

See Tourist Agents at Dept. 13, 122 E. 47 St., N.Y. 17

Port of Spain, Trinidad, B.W.I. • Montreal • London

**Something Doing Every Minute at**

**Atlantic City**

Beaches thronged with life and color... Boardwalk lined with shops and amusements for everyone... and fine oceanfront restaurants... hundreds of fine hotels.

Atlantic City, N.J. 08401





## *Pronounced as though spelled, Crry-sler*

That was the modest foot-note to the advertisement which appeared December 31st, 1923, announcing the entry of Walter P. Chrysler in the field of automobile manufacture.

The daring which led Chrysler to enter a business already dominated by giants, was reflected in the car he built which bears his name . . . now one of the great names in motoring.

After Chrysler came Plymouth and De Soto, and the acquisition of Dodge. We have been suppliers to them for years. Dodge the famous Budd has made millions of units for steel automobile bodies for all of Chrysler Corporation.

In business, one of the most important satisfactions is the thrill and stimulus of great associations. It is a satisfaction that has been our good fortune to enjoy in generations the past.

The Budd Company, Philadelphia, Detroit, Gary



**PIONEERS IN BETTER TRANSPORTATION**



"I drink all the coffee  
I want..."



"I get all the sleep  
I need!"



**DON'T STOP DRINKING COFFEE...  
JUST STOP DRINKING CAFFEINE!**

**L**ike to stop climbing your coffee habit — and  
lose the jitters of sleeplessness — just don't  
drink caffeine! Remember, it's not the coffee that  
keeps you up, but caffeine that makes many people jittery  
and unable to get good sleep.

So why not just say "no" and switch to New  
Product's Sanka Coffee? It's caffeine-free.  
And it gives you the same rich taste of choice  
as any other coffee — but without caffeine's  
side effects!

Get your Sanka Coffee today — and you'll sleep  
better than ever!

DELICIOUS IN  
EITHER INSTANT OR  
REGULAR FORM

Product of America, Inc.



**NEW EXTRA-RICH  
SANKA COFFEE**

*It's delicious! It's 97% caffeine-free!  
It lets you sleep!*

STEP INTO THE PAST AT HISTORIC

## Williamsburg VIRGINIA

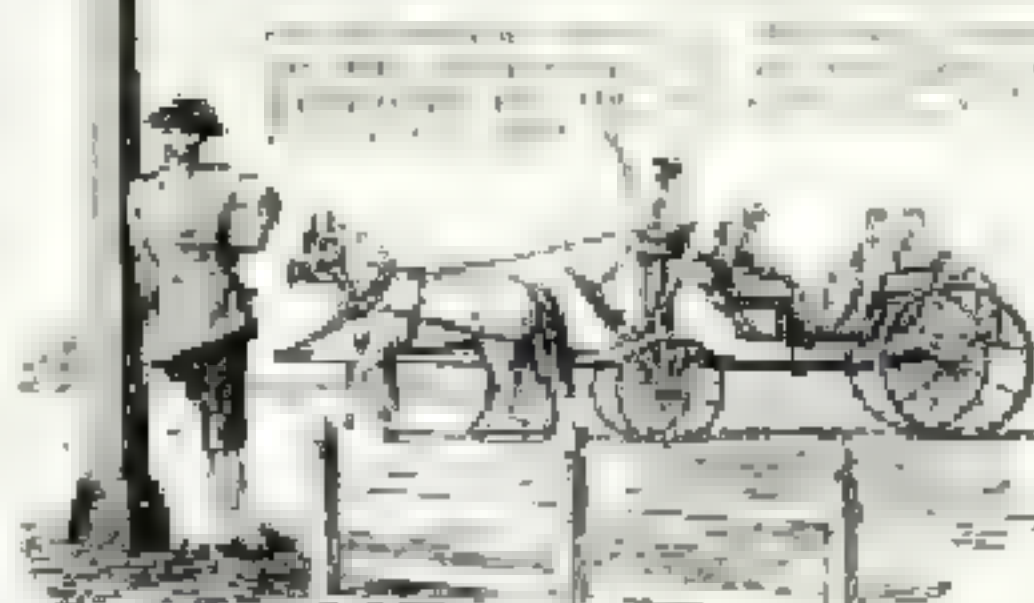
Here you will find 19 great museums housing  
the nation's largest collection of 17th century  
colonial architecture. At Williamsburg  
you can see the original 18th century  
colonial houses and the 18th century  
Williamsburg College. The Williamsburg  
Colonial National Historical Park is a  
must-see for anyone interested in  
American history.

**Williamsburg Lodge & Taverna**

Doubles from \$4.00

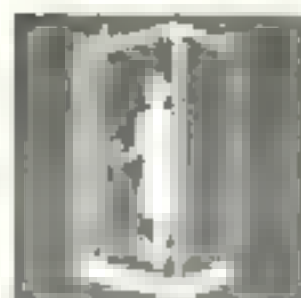
**Williamsburg Inn & Cottages**

Doubles from \$1.00



## STOP CLIMBING STAIRS

Make your life a lot easier. Ride in comfort from one  
floor to the other by having an INCLINATOR or "Elevette"  
installed in your own home. The attractive appearance  
of either will harmonize with its surroundings.



**"Elevette"**  
Small, inexpensive home lift. Built to fit  
your stairway. Safest of compact, no over-  
head machinery. Capacity 1 to 2 persons.  
Operates on standard house current.

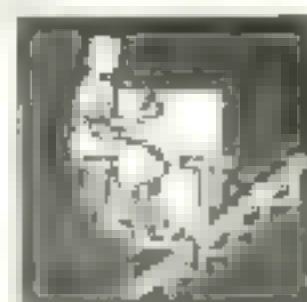
### INCLINATOR

This one is safe stairs  
climbing lift. A power  
seat mechanism where  
there is a straight stairway. Ride for-  
ward up or down. Operates on stand-  
ard house current.

Write for literature and name of nearest dealer.

**INCLINATOR COMPANY OF AMERICA**  
2228 Paxton Blvd., Harrisburg, Pa. U.S.A.

Patents in the simplified passenger lift for the home.



**Judd & Detweiler, Inc.**

Established in 1896

**Printers**

LOXINGTON PLACE AND E STREET AVENUE  
WASHINGTON D. C.

THIS MAGAZINE IS OUR INDISPENSIBLE





GRISWOLD EATERS NATIONAL PARK IS MAGNIFICENT,  
SO USE SO FANTASTIC YOU'LL NEVER FORGET IT!

TOP: ELEPHANT BUTLE NAME, PINK DOTS (1960s)  
BOTTOM: BATH EFT, DUNE INDIAN E - FLOWERS (1960s)

Want a different vacation? Come to big, high, cool,



TAGS "POOSEYAIL" DANCE IS PERFORMING AT ANNUAL  
INTER TRIBAL INDIAN CEREMONIAL AT GALLUP

[illegible]

**FISH AND CAMPTES AROUND IN  
NEW MEXICO SOUTHWEST FORESTS.**

unspoiled New Mexico-the fabulous Land of Enchantment!

[illegible]

This year — thrill to Adventure in  
**NEW MEXICO**

## THE LAND OF ENCHANTMENT



## Camps

### ADIRONDACK WOODCRAFT

Box 100, Lake Placid, N. Y.  
 Adirondack, N. Y., Box 100, Lake Placid, N. Y.

### ADM. BILLARD NAVAL CAMP

Box 100, Lake Placid, N. Y.  
 P. M. 100, Lake Placid, N. Y.

### CULVER SUMMER SCHOOLS

Box 100, Lake Placid, N. Y.  
 37 Lake Shore Place, Culver, Ind.

### FARRAGUT NAVAL CAMPS

Box 100, Lake Placid, N. Y.  
 Farragut Naval Camp, Box 100, Yemassee River, N. I.

### FENSTER RANCH CAMP

Box 100, Lake Placid, N. Y.  
 Mr. George Fenster, Dept. 10, Tucson, Arizona

### LEN-A-PE

Box 100, Lake Placid, N. Y.  
 Box 100, Lake Placid, N. Y.

### CAMP LUPTON

Box 100, Lake Placid, N. Y.  
 The Director, Box 100, Woodstock, Va.

### OGONTZ

Box 100, Lake Placid, N. Y.  
 A. Sutherland, Box 100, Ogontz Center, Pa.

### WENTWORTH CAMP & SCHOOL

Box 100, Lake Placid, N. Y.  
 Wentworth M. I., Box 100, 253 E. Main St., Lexington, Mo.

## Colleges for Women

### MARYWOOD COLLEGE

Box 100, Lake Placid, N. Y.  
 Box 100, Lake Placid, N. Y.

## Girls' Schools

### CAZENOVIA JUNIOR COLLEGE

Box 100, Lake Placid, N. Y.  
 Joseph D. Phinney, Box 100, Cazenovia, N. Y.

### EDGEWOOD PARK

Box 100, Lake Placid, N. Y.  
 Box 100, Lake Placid, N. Y.

### FAIRFAX HALL

Box 100, Lake Placid, N. Y.  
 P. M. 100, Lake Placid, N. Y.

### LINDEN HALL

Box 100, Lake Placid, N. Y.  
 P. M. 100, Lake Placid, N. Y.

### OAK GROVE & FRIENDS SCHOOL

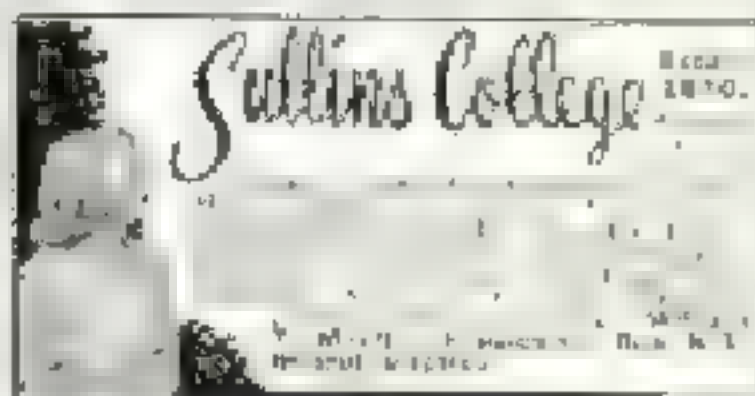
Box 100, Lake Placid, N. Y.  
 Mrs. Robert Owen, Box 100, Oak Grove, Mo.

### SOUTHERN SEMINARY & JUNIOR COLLEGE

Box 100, Lake Placid, N. Y.  
 Durham Nobuy, Box 100, Durham, Va.

### STRATFORD COLLEGE

Box 100, Lake Placid, N. Y.  
 Dr. John Simpson, Box 100, Stratford, Va.



## Coed Schools

### CHADWICK SCHOOL

Box 100, Lake Placid, N. Y.  
 Chadwick School, Box 100, Chadwick, Mo.



### JUNIOR COLLEGE

Box 100, Lake Placid, N. Y.  
 Dean Academy, Box 100, Franklin, Mass.

### ELGIN ACADEMY

Box 100, Lake Placid, N. Y.  
 Elgin Academy, Box 100, Elgin, Ill.

### SOLEBURY SCHOOL

Box 100, Lake Placid, N. Y.  
 Solebury School, Box 100, Solebury, Pa.

### WAYLAND ACADEMY

Box 100, Lake Placid, N. Y.  
 Wayland Academy, Box 100, Wayland, Mass.

## Languages

### BERLITZ

Box 100, Lake Placid, N. Y.  
 Berlitz, Box 100, New York, N. Y.

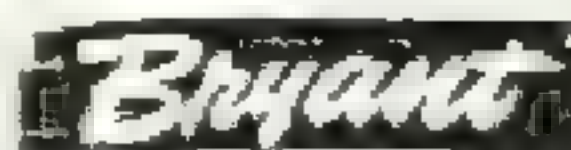
### LINGUAPHONE LANGUAGE INSTITUTE

Box 100, Lake Placid, N. Y.  
 Linguaphone Institute, Box 100, New York, N. Y.

## Vocational

### FRANKLIN TECHNICAL INST.

Box 100, Lake Placid, N. Y.  
 Franklin Technical Institute, Box 100, Boston, Mass.



### COLLEGE

Box 100, Lake Placid, N. Y.  
 Bryant College, Box 100, Providence, R. I.

### INDIANA TECHNICAL COLLEGE

Box 100, Lake Placid, N. Y.  
 Indiana Technical College, Box 100, Indianapolis, Ind.

### KATHARINE GIBBS

Box 100, Lake Placid, N. Y.  
 Katharine Gibbs, Box 100, New York, N. Y.

### TRI-STATE COLLEGE

Box 100, Lake Placid, N. Y.  
 Tri-State College, Box 100, Angola, Ind.

## Home Study

### CALVERT "SCHOOL-AT-HOME"

Box 100, Lake Placid, N. Y.  
 Calvert School, Box 100, Baltimore, Md.

Box 100, Lake Placid, N. Y.  
 Calvert School, Box 100, Baltimore, Md.

Box 100, Lake Placid, N. Y.  
 Calvert School, Box 100, Baltimore, Md.

## Colleges for Men

### PENNSYLVANIA MILITARY COLLEGE

Box 100, Lake Placid, N. Y.  
 Pennsylvania Military College, Box 100, Chester, Pa.

## Boys' Schools

### AUGUSTA MILITARY ACADEMY

Box 100, Lake Placid, N. Y.  
 Augusta Military Academy, Box 100, Augusta, Ga.

Box 100, Lake Placid, N. Y.  
 Augusta Military Academy, Box 100, Augusta, Ga.

### BAYLOR SCHOOL FOR BOYS

Box 100, Lake Placid, N. Y.  
 Baylor School for Boys, Box 100, Waco, Tex.

### BLAIR ACADEMY

Box 100, Lake Placid, N. Y.  
 Blair Academy, Box 100, Blairstown, N. J.

### BORDENTOWN MILITARY

Box 100, Lake Placid, N. Y.  
 Bordentown Military, Box 100, Bordentown, N. J.



Registration, Room 603 7-14  
Jacksonville, Florida

[illegible]

Col. M. B. Armstrong, Pres., Lebanon, Ind.

On the 11th day of the month of May 1900, the following persons were present at the meeting of the Board of Directors of the City of New York, held at the City Hall, New York City, at ten o'clock in the forenoon:

On Labor Market, page 1

W. J. Wilson, Ph.D., Assoc. Prof. of Chem., Georgia Inst. of Tech., Atlanta, Georgia.

Findlay 688 West 12th St. N. W. Astoria

В. П. Шенников, доктор физико-математических наук, профессор, заведующий кафедрой физики, Пензенский государственный университет

More Sept. 20-45 Washington, D. C.

#### \* OUR ONE SUBJECT PLAN of Study

[illegible]

The School All Achievement  
The School All Achievement

Captain D. T. Miller, D.M.S., 1908-1910

Field plots 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 87

**B. B. O'Connell, D.D.** | **Ambassador L.L. Starnes, Esq.**

[illegible]

Director, Box M-4031 Phoenix, Arizona

**GET IT FIRST! Buy now!**

COPIES OF THE INFORMATION REPORT, FORM 10-100-1, MAY BE OBTAINED FROM THE

1. The first of these is the fact that the system is not a simple one. It is a complex system, and the results of the analysis are not always straightforward. The system is a complex one, and the results of the analysis are not always straightforward.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the situation.

**Co. H. M. Hancock**, Quartermaster; **M. J. McLaughlin**, Chaplain.

C. S. Hanna, Ph.D., Dean, Minnesota P.

[illegible]

Expt. C. 2. Results are shown in Table 2. The results are similar to those of Expt. 1. The mean number of correct responses was 10.5 (SD = 2.5) for the 10 trials and 11.5 (SD = 2.5) for the 20 trials. The mean number of correct responses was 10.5 (SD = 2.5) for the 10 trials and 11.5 (SD = 2.5) for the 20 trials.

London, May 1951. *Maryon Park, Chicago 41, Ill.*



**The School of Distinction**  
develops your boy's mental  
body character, leadership  
and citizenship qualities.  
All 1941 training courses  
designed to develop the  
young American citizen  
in the following areas:  
Group Psychology, Leadership,  
Artilery, Junior School  
Band to develop available  
B. O. T. C. training

Graduated 1967 ROTC  
New York Military Academy  
51 Academy Avenue  
Essex, New York, N. Y.

**55-56 L Street - Rd. 1, Lees Gables Waco, Texas**

THE UNIVERSITY OF CHICAGO  
 5408 S. UNIVERSITY AVE.  
 CHICAGO, ILL. 60637  
 TEL: 773-936-5000  
 FAX: 773-936-5000  
 WWW: WWW.CHICAGO.EDU

Prof. L. W. Adams, Mrs. W. Adams, Illinois.



১৭৮৩ সালে ১৮৮৩ সালে ১৮৮৩ সালে ১৮৮৩ সালে  
 ১৮৮৩ সালে ১৮৮৩ সালে ১৮৮৩ সালে ১৮৮৩ সালে  
 ১৮৮৩ সালে ১৮৮৩ সালে ১৮৮৩ সালে ১৮৮৩ সালে

ONE 6-55 PENDING (WINE, N J)

1. The first step is to identify the key components of the system. This includes understanding the hardware, software, and data involved.

Headquarters, Box 305, Parkside-on-Hudson, N. Y.

**L. C. R. Webb, Dep., St. Co. Insp., Pa.**

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.



## PILLSBURY ACADEMY

Full accreditation. National reputation. Grades 4-12. Small classes, supervised study. Military training. Modern equipment. All sports good. Separate dorms for younger boys. Reasonable rates. Catalog. Dir. of Admissions, Box 553, Owatonna, Minn.

## RANDOLPH-MACON MILITARY ACADEMY

2nd Year. At northern entrance to Shenandoah River. Prepared for college by intensive study methods. Fireproof buildings. Superior without equipment. Write for catalog. Col. John C. Baggs, Prin., Box E, Front Royal, Va.

## RANSOM SCHOOL

Prepares boys 16-18 for all colleges. Resident and day students. All sports including sailing. Established 1902. Catalogue upon request. B. Pierre G. Coeuron, Coconut Grove, Miami 32, Florida.

# RIVERSIDE

Health and interest restored by Spring and Fall in Georgia mountains. Winter at Hollywood-by-the-Sea, Florida—two complete school plants, each with all facilities.

Fully accredited preparation for all colleges. Also Post Graduate Dept. ROTC. Separate School younger boys, grades 4-8. Constant association with selected teachers who live and eat with cadets. Weekly reports. Highest official Army rating. Progress GUARANTEED. Moderate rates (no extras).

For illustrated catalog, address  
GENERAL CANDY BEAVER, President

WINTER NEAR MIAMI Box 325-B, Seaside, Fla.  
FALL & SPRING IN BLUE RIDGE MOUNTAINS

## ST. JOHN'S MILITARY ACADEMY

Three-day character, course rapid academic progress. Grades 7-12 accredited. Small classes. Reading Clinic. Dr. ROTC. All sports, including flying, golf, riding. Summer school 6th yr. Catalog. Dir. of Admissions, Box 1292, Oshkosh, Wis.

## SEVERN SCHOOL

Thorough preparation for colleges, technical schools, and service academies. Grades 9-12. Small classes. Accredited. Athletics. Near Annapolis on Severn River. Limited enrollment. 6th year. Catalog. Roland M. Teal, Box 108, Severn Park, Maryland.

## SHATTUCK SCHOOL

Boys. Grades 9-12. Religious, educational, military. Accredited college prep. General courses. Small classes. Dr. Basil D. H. Sports, Gym, pool, golf, basketball. Est. 1884. Summer school. Catalog. Dir. of Admissions, 535 Broadway Hall, Fairbairn, Minn.

## SOUTHERN ARIZONA SCHOOL

Thorough college preparation in warm, dry, sunny Arizona. Grades 9-12. Accredited. CUB ROTC. Small classes. A tutor for every boy. Month. Catalog. Russell B. Fairgrove, Headmaster, Sahara Canyon, P.O. Box 1794, Tucson, Ariz.

## STAUNTON MILITARY ACADEMY

In beautiful Shenandoah Valley. Thorough college preparation. Fully accredited. Individualized study. Band. All sports. 2 year. Pool. Fine health record. Fireproof buildings. Separate Junior School. High Catalog with Map. C.M.A. Box 165, Staunton, Va. BASIC COURSE ROTC. BY U. S. ARMY INSTRUCTOR. Founded 1889



## STONY BROOK

10 Boys from 1st grade and 1 winter. Constant attention to each boy's needs. Superior college preparation. 7th grade to college entrance. Remedial method. Moderate tuition. Country Campus. Est. 1902. Frank E. Gresham, L.H. Co., Box N, Stony Brook, Long Island, New York.

## SULLIVAN SCHOOL

Effective preparation for Annapolis, West Point, Coast Guard Academy and all colleges. Catalog. Wendell E. Bailey, grad. U.S.N.A. 1924, Principal, Box D, 2107 Wyoming Avenue, N.W., Washington 8, D. C.

## TENNESSEE MILITARY INSTITUTE

One of America's really good schools. Grades 9-12. Over 95% of graduates enter college. Small friendly classes. High scholastic standards. All sports incl. golf. ROTC with year. Catalog. Col. C. R. Endler, Box 147, Sweetwater, Tenn.

## THOMAS JEFFERSON SCHOOL

With one of the best in education for young men? College preparation. Grades 9-12. Yale, Harvard faculty. Every graduate has entered college. New gym, 40 acres, complete, theatre, swimming pool. Robin H. McCoy, Headmaster, St. Louis 33, Missouri.

## THE TODD SCHOOL

Todd's creative activity program is world famous. Dramatics, Music, Farm, Shop, Sailing, Riding, Hunting, Hiking. And these thrilling activities are your boy's aptitudes are in addition to his college preparation and grades 1-12. Near to Chicago. North in Florida. Woodstock, Illinois.

## TRINITY-PAWLING

ACCREDITED. Successful preparation for all colleges. Grades 9-12. Small classes. Homelike atmosphere. Work programs. Hiking, golf, tennis. From N. Y. 100-acre rural campus. Sports. Episcopal. Catalog. M.E. Dunn, Headmaster, Pawling 1, N.Y.

## VALLEY FORGE MILITARY ACADEMY

"At the Nation's Shrine"

Prepare your boy to enter leading colleges and at the same time be trained for a commission in the Armed Services. Small classes, highest academic standards. College Prep and Jr. College, ages 13-20, all sports. Art, Civ., Infantry, Band, Senior Division ROTC. Catalog. Box M, Wayne, Pa.

## WENTWORTH MILITARY ACADEMY

University of business, professional leaders started here. For High School, separate 2-yr. College. Accredited. Dr. ROTC. Riding. Modern buses, country club. All sports, pool. Bowman House. 10th yr. Catalog. Col. Sellers, 853 West Main, Lexington, Me.

## WESTERN MILITARY ACADEMY

FACULTY accepts responsibility for students' success, inspires self-confidence, awakens interest. Prepares for all colleges. Grades 9-12. Athletics, social program. Riding. Pool. Senior ROTC. Catalog. Col. Ralph E. Jackson, Supt., Box N-5, Allen, Ill.

## WORCESTER ACADEMY

Founded 1904. Superior preparation, personal guidance based on individual needs. Development of character and personality as important as scholastic standing. Grades 9-12. All sports. Paul H. Phillips, Edm., 83 Providence St., Worcester, Mass.

PLEASE FILL IN BLANK BELOW, DETACH AND MAIL TO THE SECRETARY

# Recommendation for Membership IN THE NATIONAL GEOGRAPHIC SOCIETY

\* The Membership Dues, Which Are for the Calendar Year, Include  
Subscription to the National Geographic Magazine

To the Secretary, National Geographic Society,  
Sixteenth and M Streets Northwest, Washington 6, D. C.: 1953

I nominate \_\_\_\_\_  
PRINT NAME OF NOMINEE

Occupation \_\_\_\_\_  
(This information is important for the records)

Address \_\_\_\_\_  
PRINT ADDRESS OF NOMINEE

for membership in The Society.

Name of nominating member \_\_\_\_\_  
PLEASE PRINT

Address \_\_\_\_\_

\* DUES: Annual membership in United States, U. S. Possessions, and countries in the Postal Union of the Americas and Spain, \$5.00; Canada, \$5.50; British Isles, \$1.20; elsewhere abroad, \$5.00. Life Membership, \$150.00 U. S. Funds. Remittances should be payable to National Geographic Society. Remittances from outside of continental United States and Canada should be made by New York draft or international money-order.



## Campo Santo

"The World's finest cemetery," at Genoa, Italy, containing great masterpieces of memorial sculpture . . . examples of man's age-old urge to be gracefully remembered.



You, too, can own a

# MEMORIAL MASTERPIECE

Simple or stately, a monument is a permanent and tangible investment in peace of mind . . . because we know that here, and here alone, a family name can be perpetuated forever!

BARRE GUILD Monuments, creations of the world's finest craftsmen, are available to you in every price range. Their rare beauty, design and unexcelled quality assure you satisfaction.



Only from Barre, Vermont, comes this rare monumental stone known as Select Barre Granite. So always look for the sign of the BARRE GUILD dealer nearest you.

BARRE GUILD, BARRE 60, VERMONT

**Free Booklet** — Plan your family monument, and your cemetery plot, before the need arises. Write for "Monument Ideas" and new folder showing the latest designs.



## Monuments

"Mark of the Masters"

Mention the National Geographic — It identifies you



**This Summer . . .  
fabulous SAN ANTONIO  
and the Southwest  
are calling to YOU**

Your Summer vacation will be made more enjoyable if storied old San Antonio is the first and longest stop on your tour of the

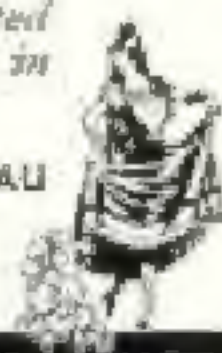


fabulous Southwest. In San Antonio, the Alamo, Shrine of Texas Liberty, together with the city's four other ancient Mis-

sions, are tops on any sightseeing list. But there are other attractions, too—historic landmarks such as the Spanish Governors' Palace, from which Viceroy's once ruled a wilderness empire; and colorful La Villita, an authentic colonial Spanish village. The Venetian-like San Antonio River offers gondola rides or water's edge dining for the visitor. Brackenridge Park, with its Sunken Gardens and its famous Zoo, is typical of the city's many beckoning parks and plazas. At Randolph Field, three other great Air Force Bases, and Fort Sam Houston, are concentrated much of the Nation's military might.

Write today for **FREE** illustrated book of things to see and do in San Antonio.

MUNICIPAL INFORMATION BUREAU  
738 Insurance Building  
San Antonio, Texas



# San Antonio

WHERE LIFE IS DIFFERENT



"What will the telephone  
be like  
when I grow up?"

It's hard to say, young fellow,  
but you can be sure there are  
great things ahead.

Today we telephone from  
moving automobiles, trains, air-  
planes and ships far out at sea.  
And radio microwaves beam  
telephone calls and television  
programs from tower to tower  
across the country.

The day is coming when you  
will be able to reach any tele-  
phone in the country simply by  
dialing a number.

Perhaps some day in the fu-  
ture you may just speak the  
number into the transmitter and  
get your party automatically.

**BELL TELEPHONE SYSTEM**

*The Best Possible Service  
at the Lowest Possible Cost*







## *Promise of a golden future*

Uranium ore from the Colorado Plateau is helping to bring you atomic wonders

Long ago, Indian braves made their war paint from the colorful sandstones of the Colorado Plateau.

**THEY USED URANIUM**—Their brilliant yellows came from carnotite, the important uranium-bearing mineral. Early in this century, this ore supplied radium for the famous scientists, Marie and Pierre Curie, and later vanadium for special alloys and steels.

Today, this Plateau—stretching over parts of Colorado, Utah, New Mexico, and Arizona—is our chief domestic source of uranium. Here, new communities thrive; jeeps and airplanes replace the burro; Geiger counters supplant the divining rod and miner's hunch.

From hundreds of mines that are often just small tunnels in the hills, carnotite is hauled to processing mills. After the vanadium is extracted, the uranium, concentrated in the form of "yellow-cake," is shipped to atomic energy plants.

**A NEW ERA BECKONS**—What does atomic energy promise for you? Already radioactive isotopes are working wonders in medicine, industry, and agriculture. In atomic energy, scientists also see a vision of unknown power—which someday may heat and light your home, and propel submarines, ships, and aircraft. The Indian's war paint is on the march again—toward a golden future.

**UCC TAKES AN IMPORTANT PART**—The people of Union Carbide locate, mine, and refine uranium ore. They also operate for the Government the huge atomic materials plants at Oak Ridge, Tenn., and Paducah, Ky., and the Oak Ridge National Laboratory, where radioisotopes are made.

**FREE!** For an illustrated story of the fascinating uranium country of the Colorado Plateau, write for the booklet "Mesa Mirete." Ask for booklet B.

**UNION CARBIDE**  
AND CARBON CORPORATION  
20 EAST 62ND STREET **UCC** NEW YORK 22, N. Y.

UCC's Trade-marked Products of Alloys, Carbons, Chemicals, Gases, and Plastics include

ELECTROMET Alloys and Metals • HAYNES STELLITE Alloys • EVEREADY Flashlights and Batteries • NATIONAL Carbons  
ACHERSON Electrodes • PYROFAX Gas • PRESTONE and TREK Anti-Freeze • PREST-O-LITE Acetylene  
Bakelite, Krene, and Vynylite Plastics • DYNEL Textile Fibers • LINDE Oxygen • SYNTHETIC ORGANIC CHEMICALS